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THE

Montreal Medical Journal.

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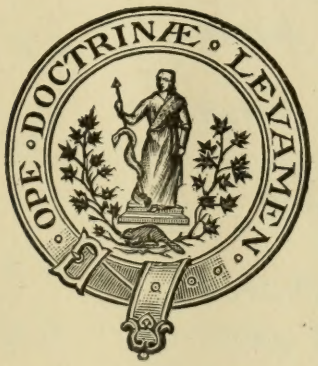

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EDITED BY

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THE
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CEREBRAL ARTERIOSCLEROSIS.

BY

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The subject of arteriosclerosis of the cerebral vessels is one which is not taken up to any extent in the usual text-books although a good deal has been written on it in the past few years in the various medical journals. This is probably to be accounted for by the difficulty, especially in the more advanced cases, of differentiating between this condition and the various senile psychoses, and the inability to demonstrate the dependence of all the symptoms on the condition of the diseased vessels.

The etiological factors are those of arteriosclerosis in other parts of the vascular system, age, sex, heredity, excessive muscular exercise, syphilis, over-eating and over-drinking, intoxications and infections, and so on. But the action of trauma as a causitive factor seems to be particularly marked on the vessels of the brain and cord, according to Sperking and Kronthal (Neurolog. Centralblatt, 1888). And in this connection it is necessary to remember that the cerebral vessels may be extensively sclerosed without corresponding evidence of the condition in the vessels of the periphery. Examination of the fundus oculi will in these cases often give evidence of the condition of the cerebral vessels and should never be neglected in the examination of the patient. Sclerosed vessels have what has been described by Marcus Gunn as a silver-wired appearance, that is, the light reflex is more marked, and where the arteries pass over the veins the latter are indented by the more rigid arteries. Whether trauma acts here as a direct etiological factor by increasing in a reflex way the blood pressure, thus producing thickening of the vessels, or as is more usual gives rise to symptoms of an arteriosclerosis which has been previously present, but in a latent condition,

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must be determined by a careful investigation of the previous history.

Clinically arteriosclerosis of the nervous system may be divided into at least two classes:

A. The mild or nervous form (Windscheid), characterized by rapid psychical exhaustion with a remarkable diminution in the aptitude for mental work. The individual is still capable of indulging in his habitual occupations, but becomes more easily fatigued. In the presence of new ideas and new business ventures he has the subjective feeling of inability to grasp the idea and handle it as he formerly would have done. Mental activity is only possible in well worn grooves. After a few moments of mental exertion he feels exhausted, often he cannot apply his attention to reading for any length of time without fatigue.

Not exceptionally we find transient loss of memory or a transient difficulty in speech, with complaints of headache and giddiness. Modifications of character may be noticed in certain cases, they become irritable and nervous, and a man who has formely shown the greatest consideration for others may become self-willed and imperious. He no longer possesses a mental equability but frequently loses control of himself, not having the necessary coolness to direct his affairs or exercise his profession, he takes a depressed view of everything and compares the present with "the good old days." In still other cases he is apathetic and somnolent.

Headache is frequently present in cerebral arteriosclerosis. In the morning on awakening the patient complains of a heavy feeling of pressure on the head, usually bilateral. During the day it changes to a definite headache, often pulsating. In some cases it follows or becomes more intense if the patient indulges in mental or physical exertion or after the ingestion of alcohol. It should not be forgotten that arteriosclerosis may give rise to an intolerance of alcohol, even in small quantities, and this may be one of the early symptoms of vascular disease. Abnormal sensations in the limbs, tingling and pricking sensations, sensations of heat and cramps, often accompanied by transient paresis, or simply a heavy feeling in the limb which may pass off in a few minutes or hours, due to a modification in the circulation of the cerebral centres.

Vertigo is frequently an early sign and one of importance, often present when the patient makes a simple change of position, as in rising from the recumbent posture. The patient often complains of a definite subjective feeling of movement inside the head and occasionally suffers from tinitus aurium. One must exclude other cerebral and organic affections capable of producing vertigo before attributing it to arteriosclerosis. Sleep is in many cases disturbed. There is difficulty in getting to sleep

and the patient wakens early, and what sleep they get is often disturbed by dreams and is unrefreshing.

Ocular symptoms are not very uncommon, cases have been reported of partial or complete optic atrophy due to pressure of the sclerosed carotid or ophthalmic arteries on the optic nerve. It seems well established also that in the early stages of arteriosclerosis of the smaller vessels, spasm of the vessels may occur from time to time, or that during periods of low blood pressure collapse of the vessel may take place, producing, when the vessels of the eye are affected, transient blindness. Wagenmann and Zeutmayer have each reported such cases in which they have observed the onset of the spasm, the subsequent ischæmia of the retina and the relaxation of the spasm with later return of vision.

Neurasthenia occurring in a patient of about 40 or 45, who previously has shown no stigmata of functional trouble should suggest the onset of arteriosclerosis. It may be an early indication of malignant disease, tuberculosis or diabetes, and it occurs in old syphilitic candidates for general paresis, but it not rarely is the earliest sign of arteriosclerosis.

One is often struck with the relative acute onset of the symptoms of arteriosclerosis. In the course of a few weeks, after some acute illness or following some mental or physical shock or strain, the patient apparently ages considerably. Evidently owing to the proverbial last straw in the scale of nutrition of the brain and various organs. "It is singular how long the rotten will hold together provided you do not handle it too roughly." The patient always recognizes the existence of the malady and there is often the fear of becoming insane, but the symptoms frequently remain unaltered for years. Death generally results from apoplexy, sclerosis of the coronary arteries or intercurrent affections. There is little tendency to passage into one or other of the more progressive forms.

The clinical phenomena are in these cases referable to a partial blood stasis, never severe enough to lead to destruction of large areas of nerve tissue. According to Alzheimer, the nerve cells in the cortex show pronounced pigmentary atrophy, but preserve a normal structure. There is an absence of phagocytes. "Spider cells" occur singly in the deeper layers of the cortex and the glia is increased in the superficial layer.

B. The second class of cases is usually found at a slightly more advanced age, about 55 as a rule. The mental faculties are often enfeebled with frequent loss of emotional control. The intelligence is diminished with more or less dementia. The gait of these patients is often typical; progression is slow, with short steps, dragging the feet not so much in a spastic way, but rather as if from weakness. The lower limbs are slightly

flexed at the joint, the trunk slightly inclined forward; one foot is advanced only five or six inches in front of the other. The tongue seldom deviates to one side and there is never hemianopsia: the reflexes are increased. There is no aphasia, but often pronounced dysarthria and sometimes dysphagia,—in fact the first stage of pseudo-bulbar paralysis. In these cases one often sees hemiplegia coming on suddenly, but not a true apoplectic stroke—perhaps a loss of consciousness for a few minutes, but usually with no loss of consciousness, and power returns inside a few hours or days. The hemiplegia is usually incomplete; on recovery there remains perhaps only a difficulty in doing finer movements with the fingers. In the lower extremities one can more easily recognize the remnants of paralysis, consisting in a slight circumduction of the leg in walking, with a slight dragging of the toe.

The disease commences with headache, giddiness, and weakness of memory, with severe psychical disturbance superadded or from the first. The patient may become emotional, resistive and apparently apathetic; lucid intervals quickly giving place to apathy are characteristic. The patient is very easily tired. The character is mostly a depressed melancholic one, never exhalted, illusions and delusions of grandeur are never present. Gradually the dementia becomes more and more complete, but always with the peculiarity that certain parts of the former personality remain intact for a long time. The patient for long time recognizes his own mental deficit, but ultimately falls into a dementia reminding one, as Binswanger remarks, of animals without cerebral hemispheres.

The pupils seldom loose their reactions. Blindness more or less transient occurs naturally more frequently than in the milder cases. There may be attacks of giddiness or epilepsy, and focal symptoms may develop such as apraxia or aphasia. The duration varies from a few months to five or six years. Death results from apoplexy, heart failure, renal insufficiency or pneumonia.

On post mortem the dura is shown to be more or less closely adherent to the cranium. The pia shows a slight of thickening, especially perhaps, in the frontal region. The convolutions are shrunken, the ventricles are dilated (senile hydrocephalus), the ependyma of the ventricles is wrinkled, giving the appearance of the roof of a pup's mouth, as Marie has vividly described it. The basal nuclei do not project as much as usual into the ventricles. There is thinning of the corpus callosum; arteriosclerotic foci may give the cortex a worm eaten appearance. On horizontal section of the brain the vessels in the lenticulo striate nucleus especially, project gaping above the cut surface; there is thickening of their different coats. The perivascular spaces show a

general dilatation more or less marked, accompanied by a rarifaction of the surrounding nervous tissue.

As the pathological factor underlying this condition and accounting for the transient hemiplegia and pseudo-bulbar palsies, one finds what Marie has described as a condition of "foyer lacunaire de désintégration," that is, little irregularly shaped cavities which look as if the cerebral tissue had been torn or destroyed. They vary in size from a hemp seed to that of a pea and in number from 1 to 10. Their usual site is the external part of the lenticular nucleus and in neighbouring internal capsule, optic thalamus and candate nucleus. They are never met in the peduncles, bulb, or cord, and rarely in the cerebellum. Under the microscope they have the appearance of a minute hæmorrhage or softening period. In recent lacunæ the periphery of their altered areas is infiltrated with numerous granular bodies (phagocytes), the cerebral tissue is breaking up and in a state of netrogression. One finds also bands of neuroglia and various sized vessels for the most part permeable, although usually the walls are thickened .

In the later stages the appearance is different. The phagocytes have disappeared, the circumference of the lacuna shows a fibrous tissue wall of varying thickness. The cavity is sometimes traversed by strands of connective tissue, with vessels which show sclerosis but are always permeable. In the cord the volume is diminished. The posterior columns stand out prominently; the vessels are sclerosed.

According to the localization of the sclerotic process in the brain the clinical and anatomical picture varies somewhat, but to differentiate clinically the various anatomical types such as encephalitis, subcorticalis chronica (Binswanger), perivascular gliosis, the senuile cortical atrophy of Alzheimer, etc., as certain German authorities attempt to do, seems to me premature, further clinical material is required.

Under the influence of the general causes of arteriosclerosis the vessels of the brain are altered and the nutrition of the organ suffers, the different parts of the brain atrophy and bring about the dilatation of the ventricles and the perivascular spaces. These latter probably play a direct role in the causation of hæmorrhage which is so common in the region of the lenticular nucleus. The vessels having lost their support and being more or less rigid are more liable to rupture. In Marie's series of fifty cases, showing these lacunæ, hæmorrhages were present in 16, and thrombosis in seven. If the lacunæ have interfered with the motor fibres in the internal capsule we have more or less degeneration in the pyramidal tracts, probably accounting for the characteristic gait.

Differential diagnosis: Clinically, we must differentiate between this

condition, senile dementia and general paresis. In severe grades of arteriosclerosis one is struck with the slowed and laboured character of the mental processes, indicating interference with the association faculty; this is associated with a feeling of helplessness and indecision. The rapidity with which such interference arises, disappears and appears again is characteristic. The consciousness of personality and the insight into their own condition remains much longer present. The affections become dulled but continue normal in character. Apart from the attacks of irritability the essential phenomena in arteriosclerotic atrophy are the direct effects of the focal lesions whereas in senile and paralytic dementia and abnormal mental phenomena, excitement and delusions are more prominent.

Anatomically, general paralysis and senile dementia are easily distinguished. Arteriosclerosis of the brain is characterized by foci of degeneration arranged around diseased vessels in which foci the nerve cells and fibres are destroyed and there is a corresponding overgrowth of neuroglia. Secondary degenerations are common, but beyond these primarily affected areas, the brain is practically normal. In general paralysis and senile dementia the process is a diffuse one.

Treatment in the milder nervous cases is most important. The general condition should be explained to the patient so that he can cooperate in the proper attention to details. He should lead a regular life, avoiding over exertion, mental or physical, and excitement. If his mind can be occupied by some gentle hobby, so much the better. With regard to the important factor of diet, Osler, quoting George Cheyne's 13th aphorism in his essay on Regimen, says: " Every wise man after 50 ought to begin to lessen at least the quantity of his aliment, and if he would continue free of great and dangerous distempers, and preserve his sense and faculties clear to the last, he ought, every seven years, to go on abating gradually and sensibly, and at last descend out of life as he ascended into it, even into the child's diet."

Medicinally, a mild saline before breakfast will help to keep the blood pressure down. Potassium iodide in 2 to 5 grain doses, t.i.d., or the sodium salt as being less depressing, is useful for the same purpose and may be combined with the sodium nitrite, or if necessary with amyl nitrite with good effect. The withdrawal of a pint or so of blood in some cases is very beneficial and is not resorted to sufficiently often in these days.

THE CUTANEOUS MANIFESTATION OF TERTIARY SYPHILIS.

BY

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While the division of syphilis into primary, secondary and tertiary periods is convenient for clinical and descriptive purposes, it is to be remembered that there is no definite line of demarcation between these periods and that many of the symptoms met with in the late secondary stage can just as properly be classed as tertiary in character. It is, however, in regard to their cutaneous manifestations that the secondary and tertiary stages are more clearly defined. The symmetrical, generalized eruptions which appear during the secondary stage are comparable to the exanthem of the acute infectious fevers, and, as in them, are but one expression of a general constitutional disorder. The slowly spreading eruptions of the tertiary stage, on the other hand, are mostly assymmetrical and localized in situation, and are not associated with any disturbance in the general health of the individual. Rarely, and then usually in cases of what one may call malignant syphilis, lesions presenting the characters of the tertiary period may be found side by side with a generalized eruption of a late secondary form.

The cutaneous lesions of tertiary syphilis are readily divided into two forms, the nodular or tubercular variety, and the gummatous. The former is of much more frequent occurrence, only 10 of 120 cases collected from the Dermatological Clinic of the Montreal General Hospital being of the gummatous variety. The tubercular syphilide begins as slightly raised, painless nodules, dull red in colour, of about the size of a pea and grouped in an irregular manner. As the disease progresses the lesions show a tendency to form ring-shaped or serpiginous figures. The lesion tends to spread slowly by the formation of new nodules, the older ones either becoming absorbed or, as is more frequently the case, ulcerating and healing without much loss of tissue. The disease process involves the corium, but does not extend into the subcutaneous tissue, and consequently the destruction of tissue is not great and the resulting cicatrix not necessarily disfiguring. Thus, in a patch which has existed some time, one finds a raised margin, where the disease is invading new tissue, behind this a zone of ulceration, and in the centre the cicatrices left as the ulcers heal. The rate at which the process spreads varies much in different individuals, but it is usually very slow, and one frequently meets with cases in which, after lasting a year or more, the

disease has covered an area not larger than the palm of the hand. There is little tendency to spontaneous cure, but in many instances the advancing margin is the only portion of the patch in which the process is active, healing having kept pace with the invasion of fresh tissue. The colour of the cicatrices is at first dull red or raw ham. It then gradually fades, and in the course of six months or a year it closely approximates to that of the surrounding skin. In some instances, however, where the tissue destruction has been deeper, thicker opaque white scars form. There is not the same tendency to a coppery staining which is such a constant feature of the healing lesions of the secondary stage.

The gummatous form of tertiary syphilide begins in the subcutaneous tissue and involvement of the skin only occurs when the gumma breaks down. When the gumma first forms it is noticeable only as a hard, painless, subcutaneous nodule or tumour, varying in size from a bean to a hazel nut. As it enlarges the overlying skin becomes involved, showing at first a dull red, then more purplish, and finally it sloughs and the broken down gumma discharges, leaving a characteristic punched out ulcer, round or oval in shape. Occasionally one meets with a diffuse gummatous infiltration of a large area of skin, dull red or bluish in colour, over which are scattered several small ulcers, not so deep as in the form already described and having a slightly raised and sometimes nodular margin.

The diagnosis of tertiary syphilis of the skin does not usually present much difficulty. In the gummatous form a single lesion may for a time be difficult to distinguish from a commencing furuncle or abscess, but as the overlying skin breaks down it soon declares its true nature. The ulcerating granulomata must be differentiated from lupus vulgaris, tuberculous ulceration of the skin, rodent ulcer and blastomycetic dermatitis. From lupus, when the disease has lasted many months, the size of the lesion as compared to its duration is of importance. Lupus progresses much more slowly than syphilis. The age of the patient is also a determining factor, lupus being more common in youth and early adolesence, while as most cases of syphilis are of the acquired rather than the inherited form, the tertiary symptoms occur later in life. The character of the lesions will generally decide the matter; the soft reddish brown or greyish tubercles of the lupus patch being quite unlike the hard nodules of syphilis. In the rarer hypertrophic form of lupus, however, there is a closer resemblance between the two conditions. Tuberculous ulceration is always associated with other forms of tuberculosis, pulmonary, glandular or generalized. Rodent ulcer is excluded by the absence of the infiltrated border of new growth preceding the breaking

down, such as we see in all cases of tubercular syphilis, and also by the excavating character of the ulceration. From the gummatous form, the gummatous form, the history of a subcutaneous tumour preceding the skin lesion will suffice to distinguish it. Blastomycetic dermatitis closely resembles the tertiary syphilide and it is at times difficult to decide between the two diseases. Some dermatologists are of opinion that the blastomyces parasite may even become engrafted upon a syphilitic ulceration. In doubtful cases the presence of the yeast fungus in the tissues can be demonstrated microscopically. And, finally, the rapid improvement of tertiary syphilitic lesions under treatment by iodide of potash will clear up the diagnosis in all doubtful cases except as regards blastomycetic dermatitis, which is also benefitted by the iodides.

An analysis of 120 case reports of tertiary syphilides has furnished the following data regarding some of the features of the disease.

The number of individual lesions is usually small. In 120 cases, 42, or 35 per cent., had only a single lesion; 27, or 22 per cent., presented only two lesions, and in 52, or 43 per cent., there were three or more.

A symmetrical distribution was noted in 103 of the cases, more or less roughly symmetrical in 17.

Practically every portion of the body may be attacked, but the disease shows a decided predilection for certain situations. Of 220 individual lesions of which the situation was noted, 63, or 29 per cent., involved some part of the face. Of these there were 24 upon the forehead and 29 upon the nose and cheeks. The arms and legs were about equally affected, 54 lesions being situate upon the arms against 55 on the legs. The neighbourhood of the larger joints is another favourite situation, 52 lesions, or 28 per cent., being thus located. The shoulder is an especially common locality, it being involved 22 times or in nearly one-half of the total lesions about the joints. Among the most infrequent situations were the scalp, genitalia, mammary glands and heel, in each of which there was only one instance. The triangle overlying the sacrum, which generally escapes in secondary eruptions was only involved twice.

The chronicity of the disease is well shown by the following table. Of 57 cases of which I have notes:

33 cases had lasted one year or less.
9 cases had lasted 1 to 2 years.
3 cases had lasted 2 to 3 years.
2 cases had lasted 3 to 4 years.
5 cases had lasted 4 to 5 years.
6 cases over 5 years.

Lesions were reported by patients to have lasted 6, 8, 10, 12, 13, and 25 years. In all probability this long duration would be more properly classed as a frequent recurrence rather than continuous presence of the sore. There were 22 cases lasting under one year, the average duration of which was four months.

The length of time which had elapsed between the primary infection and the last appearance of tertiary symptoms was worked out in 33 cases.

Between 2 and 5 years after the first infection, 19 cases.
Between 5 and 10 years after the first infection, 8 cases.
Between 10 and 15 years after the first infection, 8 cases.
Between 15 and 20 years after the first infection, 3 cases.
Between 20 and 25 years after the first infection, 3 cases.
30 years after the first infection, 1 case.

This shows conclusively that a person who has once suffered from syphilis can never be looked upon as entirely free from any danger of late tertiary lesions, even though many years have elapsed without the disease having given any sign of its existence. Much of course depends upon the form and duration of treatment during the active or secondary stage. This point I endeavoured to establish, but in the class of patients from whom these records were obtained it was impossible to determine what form of treatment if any had been adopted during the secondary period.

The 120 patients consisted of 51 males and 69 females. The average age was 36, the youngest being 19 and oldest 70.

An interesting point to determine is the proportion of cases in which it is possible to get a definite history of syphilis. Unfortunately in only a small number of the total cases was this information possible, partly because in many of the female patients it was not thought advisable to inform them of the true nature of their disease, and thus the point could only be determined by a previous history which, though perhaps pointing strongly to an attack of secondary syphilis, was not conclusive. Then, the diagnosis was not dependent upon the existence or otherwise of a previous history and in many reports there is no mention of whether the question had been asked or not. These it would not be right to include as having no previous history, for whilst amongst the males of the educated portion of the community a knowledge of the grave nature of syphilis is almost universal and the probability of an individual forgetting that he had ever suffered from the disease is extremely slight, among the class of persons applying for out-door relief at our hospitals a history of previous illnesses is notoriously untrustworthy. By taking

only those cases of unquestioned diagnosis and from which the previous history could be readily obtained, the majority being males, we find that out of 45 cases 15 or 25 per cent. had no memory either of having had the disease or of any symptoms which would go to show that the disease had been present but unrecognized.

In the treatment of syphilis in general it is now universally recognized that mercury and the iodides are the only reliable therapeutic agents. Many writers, however, refuse to accord to the iodides by themselves any value as a specific remedy in syphilis, looking upon them merely as an aid to the action of mercury. Dermatologists are inclined to regard each as having its particular place according to the period of the disease, mercury being indispensable during the secondary stage, and both of value in the tertiary. That the iodides used alone may be regarded as specific in the cutaneous forms of tertiary syphilis is, I think, proved by the results obtained from its use in the Montreal General Hospital, where we can say that in all cases in which there was a record of continuous attendance of at least a month, there was marked improvement noted. Unfortunately, the number of cases treated to a conclusion was not large, mainly because a large proportion of out-patients cease to attend as soon as they have any evidence of improvement. Of forty cases treated to a conclusion, eight were cured within one month, seven in six weeks, eleven in two months, three in two and a half months, nine in three months, and two in four months. The average time of disappearance of all symptoms of the disease in these forty cases was about two months. There has been much controversy over the proper method of administering the iodides. Many writers claim that a small dose given before meals is as efficacious as a large dose given after meals. On this point I can venture no opinion, the custom of my chief, Dr. Shepherd, of giving the drug after meals in large doses well diluted having been followed in all hospital cases. The initial dose given in almost all cases was twenty grains three times a day taken after meals in a tumbler of water. If this was not sufficient to produce immediate improvement in the eruption the dose was increased once a week, five grains at a time, until the patient was taking forty or even sixty grains three times a day. It was, however, rarely necessary to exceed the initial dose of twenty grains. That the quantity of the drug given was of great importance was shown many times by the cases which were referred to us from other clinics with a diagnosis excluding syphilis because of their failure to respond to doses of five or ten grains three times a day. These rapidly yielded to the larger doses. I believe, however, that it is wise to substitute tonics for the iodides in these cases for a couple of weeks before putting them on larger doses.

Potassium iodides was most commonly used, but in a few cases where it produced untoward symptoms, the iodide of ammonium was substituted for it with benefit. It was remarkable in how few cases large doses of iodide of potash led to intoleration. This may be partly because of the method of administration, but I think anyone who has had experience with its use in both tertiary syphilis and other conditions cannot but be struck with the remarkable absence of the usual untoward effects in tertiary syphilis. So much is this the case that a marked intolerance of large doses of iodide of potash leads one to doubt the diagnosis of syphilis. Locally, the unguentum hydrargyri ammoniatum of the B. Ph. was used.

In conclusion there are several points in connection with tertiary syphilis of the skin which I would like to emphasize. In the matter of diagnosis, the absence of a previous history of syphilis must not be given too much weight. A case in point is the following:—W. I., male, aged 57, unmarried, came to me on account of an eruption on one buttock and leg which had defied all attempts at healing by external applications. Clinically it was a tertiary syphilide. The patient was an intelligent man, not one of the hospital patients, and admitted having had gonorrhœa thirty years previously, but had no memory of having taken treatment for more than a few weeks, and was positive he had not an eruption on the skin either at that time or since. Twenty grains of iodide of potash caused the eruption to heal completely in three weeks. This case also illustrates another point, namely, that long freedom from symptoms, in this case thirty years, must not be held to negative syphilis, until the therapeutic test has been applied.

The tendency of the disease to reappear is shown by the following:—J. L. M., male, aged 30, came to the clinic in February, 1890, with a roughly symmetrical tubercular eruption over the arms and legs. There was a history of syphilis five years previously. After a few weeks he ceased attendance to return in December, 1890, nine months later, with ulcerating lesions on each shoulder and the left elbow and knee. After a few visits we did not see him again until nine months later, September, 1891, when he had an ulcer on the left deltoid. In July, 1892, after nine months again, he came back with an ulcer on his forehead.

Here we had three relapses within a little over two years, but on each occasion treatment was only carried on for a few weeks at a time. The other side of the picture is shown in another hospital case. Mrs. F., aged 48, Polish Jewess, came to the clinic in June, 1898. She gave a history extending over five years, of an ulceration followed by scarring of a peculiar character and never healing completely. On the right

elbow there was an irregularly shaped patch measuring four by three inches with a raised margin covered with crusts which on removal showed shallow ulcers. The scar tissue was coarsely cribriform, the criss-cross lines in it being raised considerably above the surface of the skin. Through an error in writing the prescription she was given forty grains of potassium iodide three times a day and she returned in a week with very marked improvement, and in four weeks the ulcers were completely healed. She volunteered the information that she had taken the same medicine for years from a clinic in Vienna, but that it had never done more than keep the disease in check. The iodide was kept up in diminished doses, 10 grains, for seven months. This woman continued to come to the clinic at intervals for five years for eczema intertrigo; but there has been no return of the disease. This case too emphasizes the necessity of using large doses of the iodide.

DIAGNOSIS OF THE COMMONER INFLAMMATORY DISEASES OF THE EYE.

BY

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There are certain inflammatory affections of the eyeball that are not infrequently mistaken for one another, especially by those who are not brought in daily contact with them. An error made in diagnosis is not only likely to be of serious consequences to the organ affected, but is apt to prove humiliating to the physician or surgeon who first sees the case and does not at once institute the treatment that each demands. Under ordinary circumstances no great difficulty should be experienced in classifying these various affections and distinguishing between inflammations of the conjunctiva and iris, and glaucoma, three conditions in which mistakes are of not uncommon occurrence. The treatment of each is so widely different that those remedies that are indicated in one are contraindicated in either of the others.

Speaking generally, these inflammations have characteristics which, to the casual observer, resemble one another so closely that the real disease is quite easily overlooked. It happens that the reddened appearance presented by the eyeball (due to the engorgement of otherwise invisible vessels upon a background of the white sclera) is common to most inflammations of the eye. Not only in the superficial, but in the deep-seated ocular lesions as well, one or all, the venous and arterial systems of the anterior segment of the globe become affected and more or less deeply tinge the otherwise whitish globe.

Taking this clinical observation as a starting point and combining with it careful inspection of the eye itself, we may readily distinguish the various eye inflammations from one another and from affections non-inflammatory in character, by means of the following plan:

1. The eyeball is wholly or partially reddened without discomfort or other symptom.

2. The eyeball is reddened and uncomfortable, but without actual pain.

3. The eyeball is red and distinctly painful.

Taking these divisions up in the order outlined and referring briefly to the most important symptoms and characteristics of the various infections:

1. THE EYEBALL IS WHOLLY OR PARTIALLY REDDENED WITHOUT DISCOMFORT OR OTHER SYMPTOMS. Practically only one condition is included under this heading, viz: *subconjunctival hæmorrhage*, which is not an inflammatory affection. There is no discharge from the eye, and close inspection of it shows that the redness is localized as a deep red, smooth, uniform patch, obscuring the scleral vessels. Except in the recurrent type and in patients over 40 years of age (when Bright's disease, arterio-sclerosis or organic heart lesions may be suspected) it is an innocent condition.

2. THE EYEBALL IS REDDENED AND UNCOMFORTABLE, BUT THERE IS NO MARKED PAIN. Under this head come (1) hyperemia of the conjunctiva. (2) Foreign bodies in the cornea and conjunctival sac. (3) Phlyctenules on the conjunctiva. (4) Acute and chronic conjunctivitis.

Of the various inflammations of the conjunctiva the milder hyperemias are largely the result of local conditions such as errors of refraction and exposure to unhealthy surroundings as wind, dust, smoke and impure atmosphere. These present no marked symptoms outside of itching, smarting, burning and foreign body sensations. The lining of the everted lids looks redder and rougher than normal. The redness eventually extends to the ocular conjunctiva, where the subconjunctival vessels, especially in the upper and lower cul-de-sacs are enlarged. No secretion forms, except a little at the inner canthus, which occasionally glues the lid edges together in the morning. The more severe conjunctival inflammations such as acute conjunctivitis, purulent conjunctivitis, etc., are due to an invasion of the mucous membrane by one or more of the micro-organisms that infect it. In the secretions of the normal conjunctival sac a variety of micro-organisms are found. Although a number of these bacteria (cocci or bacilli) are non-pathogenic in character, both they and the pathogenic varieties are generally present. Almost all

of them are capable of setting up an inflammation under favourable conditions. Just what constitutes this favourable condition it is not possible to say in every instance, but we do know that an abrasion or some irritation of the mucous membrane is the most favourable aid to microbic propagation and its pathological results.

In most forms of acute conjunctivitis a microscopical examination of the discharge makes a diagnosis comparatively easy. For instance, in the variety known as acute contagious conjunctivitis, more easily recognized under the more common term of "pink eye," the Koch-Weeks bacillus is found in the secretions, while the pneumococcus and the diplobacillus of Morax-Axenfeld and the gonococcus of Neisser is found in other varieties of conjunctival inflammations.

The various forms of conjunctivitis have signs and symptoms similar to one another, the character of which depend largely upon the severity of the inflammation. Usually there is no distinct pain, but smarting, burning and foreign body sensation, with a mucous and muco-purulent or purulent discharge which is found on the lid edges and at the inner canthus, in sufficient quantities to glue the lashes together so that they must be washed apart before the eyes can be opened after a night's sleep. The injection and swelling of the conjunctiva, and a loss of its transparency, is well seen on everting the lids and inspecting the posterior aspect of the globe. The conjunctival vessels on the globe are in most cases enlarged, particularly at the junction of the lids and eyeball in the retrotarsal folds. The conjunctival vessels run loosely in the conjunctival tissues, so that they may always be differentiated from the deeper vessels by the fact that they can easily be moved to and fro with the membrane itself.

Acute contagious conjunctivitis, commonly known as "pink eye," is usually met with in the spring and fall months, when probably set up by wind and infected dust, it is frequently epidemic. In about two days after infection the ocular conjunctiva becomes deeply injected, giving it a bright red appearance, the redness extending to the margin of the cornea; hence the name "pink eye." The conjunctiva is swollen and presents a succulent appearance. Photophobia and lachrymation are a source of discomfort to the patient, and pain is sometimes present, but not as severe as in the deeper inflammations of the eyeball. Slight hæmorrhages are sometimes present on the ocular conjunctiva. The discharge, which is muco-purulent in character, is usually quite ropy and accumulates in the form of flakes in the retrotarsal folds. The lids stick together in the morning, while dried secretion is found adhering to the margin of the lids and to the eye-lashes. Sometimes there is a slight

chemosis present, in which case the nutrition of the cornea is liable to suffer and ulceration may take place, not only from pressure upon the vessels in that region, but following infection from the discharge retained in the sulcus. This affection is usually at its height at the end of the third day. It is sometimes accompanied by rise of temperature and other constitutional disturbances. The symptoms gradually subside after a week or ten days, but recovery may not take place until the end of two or three weeks.

PURULENT CONJUNCTIVITIS. It is sometimes difficult to draw a sharp line between the severer forms of acute contagious conjunctivitis and simple purulent conjunctivitis. In the latter, however, the chemosis is greater, while the discharge is more profuse and more purulent in character. The lids also become hard, tense and greatly swollen; the cornea is more often infected and ulceration more frequently occurs. The inflammation permeates the deeper structures and the subconjunctival tissue is infiltrated with inflammatory exudates. In the more serious cases of purulent conjunctivitis the gonococcus of Neisser is usually found. This disease attacks particularly the new-born (*ophthalmia neonatorum*) and the adult (*gonorrhœal ophthalmia*). In *ophthalmia neonatorum* the infection usually takes place during the passage of the child's head through the vagina, so that the symptoms almost invariably show themselves during the first three days after birth. If it occurs at a later period the infection is probably not gonorrhœal but comes from soiled fingers, cloths, towels, sponges, etc. One eye is commonly affected one or two days before the other, although in some cases it is possible, if preventative measures are taken early enough, to prevent infection of the second eye. In the majority of cases, and especially in the severer forms, the gonococcus of Neisser is found to be present in the discharge. There is usually a history of the mother having suffered from a leucorrhœa for some time previous to the birth of the child, or of the husband having recently had gonorrhœa or gleet. The redness and discharge which is slight at first, quickly increases and the lids become shiny and swollen, so puffed out that the upper lid falls down and covers the margin of the lower lid. The palpebral skin shortly after becomes tense and hard and of a dusky red colour, so that it is almost impossible to evert either lid. The conjunctiva is very red and much swollen, presenting a velvety appearance from the enlargement of the papillæ. This congestion rapidly extends to the ocular conjunctiva, which becomes intensely red and edematous, overlapping the margin of the cornea, so that the latter appears at the bottom of a pit surrounded by a hard rim of infiltrated and edematous tissue. The discharge at first slight and

yellowish in colour, is soon very profuse and of a cream-like consistency. It is secreted rapidly, accumulates in the cul-de-sac and flows from between the lids onto the cheek. In consequence of haemorrhage from the ruptured capillaries the discharge may assume a yellowish-green colour from admixture with blood. The disease usually runs its course in about six weeks. The chief danger is to the eyesight. The disease may affect the cornea, the vitality of which is always lowered, partly by strangulation of the vascular supply induced by the intense edema of the conjunctiva and partly from direct infection. When this occurs the surface of the cornea becomes hazy, dull, and lusterless. This condition is soon followed by the formation of one or more ulcers which spread rapidly, followed by perforation of the cornea into the anterior chamber and the formation of a dense white scar as the opening heals. Fortunately, in these days of antiseptic surgery, there is less danger of the child's eyes becoming infected than formerly. Where a discharge is known to exist regularly, daily cleansing of the vagina should always be insisted upon. After the birth of the child the lids should be wiped dry with a piece of sterilized gauze, the eyes should be carefully opened and with a sterilized medicine dropper one drop of a two per cent. solution of nitrate of silver should be carefully dropped on the exposed cornea. This is the method of Crédé which, if carefully carried out, will greatly minimize the danger of infection. By this method Crédé reduced the percentage of cases occurring in the Leipsic hospital from about ten per cent. to 0.2 per cent.

Foreign bodies in the cornea or conjunctival sac are always to be suspected when the patient complains of constant scratching and a sensation of foreign body. The sac and cornea should be carefully scanned with a magnifying lens when these symptoms are present.

Phlyctenules of the conjunctiva are distinguished by the formation of small elevations or pimples on the conjunctiva. This is a disease of childhood and is frequently accompanied by an eczematous eruption behind the ear, on the face and at the corners of the mouth and nose. The child presents a strumous appearance. The phlyctenule consists of a small, solid, reddish elevation, made up of a collection of lymphoid cells beneath the epithelial layer of the conjunctiva. In a short time the epithelium becomes destroyed and ulcer forms. Fresh attacks frequently occur, new phlyctenules appearing on other portions of the conjunctiva before the first outbreak has disappeared. As a rule the disease extends to the cornea, forming ulcers, the resulting scar from which is apt to interfere with vision. The patient suffers from intense photophobia and lachrymation. The child buries its head in the mother's lap or in a pil-

low and seeks dark corners of the room to get away from the light. The lids are tightly closed (*blepharospasm*) and any attempt to open them is met with decided resistance.

The eyeball is red and painful. These symptoms are common to iritis, glaucoma, phlyctenules and ulcers of the cornea, scleritis and episcleritis.

In Iritis the redness, beginning as a pinkish hue, is first confined to the corneal region of the ocular conjunctiva, although in a few days all the vessels of the globe are engorged and the eyeball assumes a dusky-red colour. Pain which is slight at first soon becomes very severe and radiates over the brow and sometimes down the cheek. It is usually severe at night, keeping the patient awake. The eyeball becomes very tender and sensitive to the touch, probably due to the involvement of the ciliary body whose blood supply is intimately connected with that of the iris. There is also marked photophobia and a copious flow of tears. Discolouration, loss of luster and a swollen muddy appearance of the iris surface are early manifestations of the inflammatory changes, a brown iris changes to yellow, while a blue iris takes on a greenish hue. The pupil is contracted and its usual reactions to light and accommodation are affected. This is due to a number of causes: The engorgement of the iris vessels; spasm of the sphincter of the iris; exudates into the substance of the iris; or, as usually happens when improperly treated, adhesions of the iris to the anterior capsule of the lens. Exudates are almost invariably present on the posterior and anterior surfaces and margins of the iris and are of glue-like consistency. This is what causes adhesions to form between the iris and lens (*posterior synechiæ*) and is the chief cause of blindness from iritis. The pupil is often bound down to the lens about its whole circumference (*ring synechiæ, exclusion of the pupil*) so that it becomes immovable; or adhesions take place at various points along the pupillary margin, causing the pupil to contract and dilate irregularly when exposed alternately to deep shadow and strong illumination. This irregular dilation of the pupil is shown when a mydriatic is instilled into the eye. Eventually, the pupillary space may become covered with an exudate, and if this be dense, vision is very seriously impaired. This condition is known as occlusion of the pupil.

It not uncommonly happens that iritis is mistaken for conjunctivitis or vice versa, a mistake which may prove very serious as it involves the eyesight of the patient. An error in diagnosis may be avoided by observing the following points of difference between these common forms of ocular inflammation.

IRITIS.	CONJUNCTIVITIS.
Pain.—Often severe; worse at night, felt in and above the eye.	None, but some smarting, burning, and sensation of foreign body.
Redness.—Especially marked as a zone about the corneal margin.	More general.
Pupil.—Contracted, sluggish or immobile; iris altered in colour.	Pupil and iris not affected.
Vision.—Affected.	Not affected.
Lids.—Non-adherent.	Adherence of lids.
Discharge.—Watery.	Mucous or muco-purulent.
Photophobia.—Marked.	None.

Phlyctenules of the cornea present symptoms very similar to those described under a similar condition of the conjunctiva, viz.: intense photophobia, lachrymation, blepharospasm.

Ulcers of the cornea. The detection of corneal ulcer presents few difficulties if it is at all extensive, although small and superficial ulcerations are easily overlooked. If the reflection from a window be allowed to fall upon the affected cornea the image of the cross bars will appear broken or irregular. One of the surest means of detecting the presence of an ulcer is to allow a few drops of a two per cent. solution of potassium fluoresceid to flow over the surface of the cornea. Fluorescein, gr. viii; liq. potassæ ℥ss; aquæ dest, ℥;). This solution renders the denuded portions of the cornea green or greenish-yellow and accurately maps out the limits of the scar. Corneal ulcers are usually due to the entrance into the corneal substance of some one of the micro-organisms productive of inflammatory conditions. The virulence of the infection depends upon the nature of the bacterium, whether it be the gonococcus, streptococcus, staphylococcus, pneumococcus or other germ. Opacities of the cornea invariably follow ulcers in this situation, the resulting scar materially affecting vision, the defective sight depending upon the situation and density of the cicatrix.

Glaucoma. This disease is essentially due to a damming or blocking of the drainage from the interior of the eye. The chief lymph stream secreted in the interior of the eye proceeds over the lens through the zonula of Zinn into the posterior chamber, past the margin of the iris, through the pupil into the anterior chamber, transverses the latter to reach the angle of the anterior chamber formed by the junction of the iris and sclera, passes through the losse tissue at this point, and by diffusion and filtration is taken up by Schlemm's canal and from this canal into the external lymph channels.

Obstruction to the steady escape of the intra-ocular fluids at any point in this drainage system or any undue increase of the fluids themselves, may produce glaucoma. Probably the most important obstruction to the exosmosis is at the angle close to Schlemm's canal. In many excised eyeballs affected with glaucoma the periphery of the iris has been found adherent to the cornea so as to prevent the flow of the fluids in the canal of Schlemm.

Acute glaucoma with which we have to deal, appears in inflammatory outbursts, attended by severe pain in and congestion and redness of the eyeball. Associated with these symptoms is temporary impairment of vision, usually the first symptom, the blurring lasting for a short time, then followed by the vision clearing again. It is also attended by loss of focussing power, and necessitates the frequent changing of glasses, as it usually shows itself in persons over 40 years of age. During these periods the patient notices rings (halos) of various colours about gas jets or other flames. The pupil is dilated and the anterior chamber becomes shallow. Eventually the loss of vision becomes permanent. The pain which is transient and slight at first, soon becomes severe and more constant, and as the disease progresses, almost unbearable. It is referred not only to the eye itself but to the region surrounding the eye, radiating over the brow to the side of the nose and cheek and is very apt to be mistaken for facial or supra-orbital neuralgia. The eyeball, slightly congested at first, soon becomes plainly red and inflamed, especially in the zone surrounding the cornea (ciliary region), while the scleral vessels are dilated and tortuous. The cornea is hazy and has a breathed on appearance and finally becomes more or less insensible to the touch. The tension of the eyeball is distinctly raised, especially at each of these attacks, often returning to normal during their subsidence, but finally the eyeball remains distinctly harder than normal.

On examining the interior of the eye with the ophthalmoscope, very little, if any, abnormality can be detected in the early stages, although during an attack pulsation of the arteries may be perceived. In the late stage of the disease cupping of the nerve will generally be noticed. Usually the disease progresses until it ends in complete disorganization of the structures of the globe. The lens becomes opaque, the iris atrophies, and hæmorrhage takes place in the interior of the eyeball. Bulging of the coats of the eyeball (*staphyloma, ectasia*), especially in the neighbourhood of the ciliary body, frequently occur from the continuous increase of tension, until the eye feels and looks as if it were going to burst. Indeed, removal of the globe or its contents is often the only measure that gives the patient relief from his intense suffering.

Although these signs and symptoms resemble one another very closely so that the diagnosis is apparently attended with some difficulty, there are certain characteristics which each disease holds particularly as its own and which serve to distinguish it from other inflammatory affections. If these are given careful consideration the observer will experience little trouble in arriving at a correct diagnosis of each case as it presents itself.

The following table will be of assistance in classifying the various ocular inflammations and will show at a glance the main points in diagnosis.

Eyeball Wholly or Partially Reddened without Discomfort or Other Symptoms.	Eyeball Reddened and Uncomfortable but there is no Marked Pain.	Eye Painful and Red.
1. Subconjunctival Hemorrhage. (a) Redness localized as a deep, red, smooth, uniform patch. (b) No discharge.	1. Hyperemia of the Conjunctiva. (a) Everted lids redder and rougher. (b) Burning, smarting, itching. (c) Foreign body sensation. (d) Discharge slight. 2. Foreign Bodies in Cornea or Conjunctival Sac. (a) Constant scratching. 3. Phlyctenules in Conjunctiva. (a) Small pimples on conjunctiva surrounded by patch of blood vessels. 4. Acute and Chronic Conjunctivitis. (a) Smarting, burning and foreign body sensation. (b) Mucous, muco-purulent or purulent discharge. (c) Adherence of lids in morning. (d) Injection and swelling of conjunctiva.	1. Iritis. (a) Ciliary injection and redness. (b) Photophobia marked. (c) Lachrymation copious. (d) Tenderness. (e) Pupil contracted and sluggish to light and accommodation. 2. Glaucoma. (a) Increased tension of the globe. (b) Attacks of pain, neuralgic in character at first, later more constant. (c) Lowered vision. (d) Pupil dilated. (e) Shallow anterior chamber (f) Hazy cornea. 3. Phlyctenules of the Cornea. (a) Disease of childhood. (b) Intense photophobia and blepharospasm. (c) Lachrymation. 4. Corneal Ulcers. (a) Loss of substance. (b) Solution of fluorescein stains ulcer green.

POTT'S PARAPLEGIA CURED BY THE PLASTER BED.

BY

J. Appleton Nutter, M.A., M.D.

N. A., aged 7 years and 4 months, has a history dating back nearly two and a half years. The disease began in the summer of 1906, when, without any trauma, she was noticed to walk peculiarly. She had had typhoid fever some six months previous, and her gait was thought to be

merely a bad habit, for which she was frequently reprimanded.

In the fall of 1906 she was found to have a kyphos between the shoulders, and soon after this she began to walk stiffly and clumsily. It was not long before she was unable to walk at all, but sat on a low chair supporting her chin in her hands. She had absolutely no pain.

In June, 1907, Dr. J. J. Ross, the family physician, asked me to see her. At that time she had a well marked angular kyphos about the 7th cervical, 1st and 2nd dorsal vertebræ, with marked spasm and rigidity of the upper spinal muscles. Her legs were very weak indeed, and when told to raise them in the air she generally did so by pulling them up by the stockings. She could not walk and had not done so for six months. There was no sensory disturbance. The knee jerks were very much increased; but the chief sign, apart from the paralysis, was a very marked ankle clonus, which could be elicited by the slightest strain on the endo-achillis. She had no Babinski sign. Her sphincter area was involved, so that when she called for the bed-pan, it could rarely be got to her in time. There was evidently pressure on the spinal cord at the seat of deformity, and this was presumably due to a tuberculous pachymeningitis with thickening, which pressed the dura against the dorsal cord.

She evidently needed rest for the spine with as much hyper-extension as could be got, and all the fresh air, sunlight and good food possible. She was put in a hammock face down, and the plaster bed which you see was applied to her back and head. After the plaster had set it was removed to dry, and for the next six months she lay comfortably in it, the whole being securely fastened to a Bradford frame.

In this way she could be moved easily, and spent most of the day-time in the sun on the back gallery. As she had a marked foot-drop, a box was always placed at her feet to support them at a right angle. Her appetite was good and her bowels regular, and her grandmother proved an unrivalled nurse. In a few weeks the legs showed a good return of power, and could be raised unaided in the air. The increased knee jerks also disappeared, but it was not until she had lain some two and a half months in the plaster bed that the ankle clonus left, never to return. She was kept quiet however three and a half months longer, and in January of this year a jury mast was applied, fitted to a plaster jacket. She was then allowed to sit up and in a few weeks to stand and so to walk. In June, 1908, a new jacket and jury mast were applied, and these are still in use. When they are worn out she will wear a light support of leather or plaster to keep the spine hyperextended, and probably by the spring she will discard all apparatus. She is now quite healthy and happy, and has had no return of the paraplegia whatever.

The paralysis of Pott's disease occurs in some six per cent. of all cases. It is most commonly found when the disease is in the dorsal vertebrae, especially the upper and middle regions, when disease is here, paralysis may be expected in 15 per cent. of cases. This may be due to the smaller calibre of the vertebral canal at this part, or to the difficulty in fixing the spine when the disease is at this level. The paralysis is seldom caused by direct pressure of the bone, as it is uncommon for even severe deformities to narrow the spinal canal to any great extent. In fact, it is more often associated with slight than with extreme deformity. The process ordinarily begins as an external pachymeningitis, causing thickened meninges begins as an external pachymeningitis, causing thickened meninges and pressure on the cord. Myelitis at times develops, followed by ascending and descending cord degeneration. The prognosis is favourable in mild cases, and even in severe ones if they can be treated early. Compression from thickened meninges can generally be relieved by rest and strong hyper-extension, but if myelitis has set in there will be irreparable cord destruction of greater or less extent. Fortunately this latter condition is not often seen, as the paralysis usually, if cured, leaves no traces behind. Paraplegia is one of the later symptoms of Pott's disease, developing generally some years after the onset. It may, however, be the first sign of the disease. The occurrence of myelitis in a young child should therefore be considered as extremely suspicious.

In general the paralysis is preceded by an exacerbation of the disease, with increase of pain. One of the first signs is an increase in knee jerks and the pressure of ankle clonus. This is followed by a spastic gait and inability to walk. Involvement of the sphincters generally indicates a fairly severe attack, and if the case gets worse sensory disturbances follow.

As before, the treatment is rest in a plaster bed or on a frame in either case, in strong hyperextension. Cases of paralysis average seven months from the beginning of treatment until the complication has disappeared. Laminectomy is not gaining in favour, and is not indicated until conservative treatment has been faithfully tried for a long period of time.

APHASIA, AUDITORY AND MOTOR, WITH RE-EDUCATION.

BY

NORMAN VINER, M.D.

Patient, S. C., 20 years of age.

Complaints.—Defective speech and hearing.

History.—Running from left ear commenced when 18 months old. At 3 years had acute illness with angina and convulsions, followed by

complete and simultaneous loss of speech and hearing. Other faculties and general intelligence remained normal and developed with years. From the sixth to ninth years would, at intervals of several months, spontaneously utter some irrelevant word. At nine years she was put at light work in a shop, as a result of which she began to make use of a few words. Having observed this, her parents placed her under the teacher of a small class. Here, she was taught to read and write Russian and Yiddish and to read Hebrew—that is, she could read but with laboured and indistinct articulation, and the writing was also very limited. She was at school for two years and since then the improvement has been very slight.

Present Condition.—General physical condition and development good. Mental condition normal; intelligence good, except in so far as its development has been limited by her ailment. Patient is right-handed. All systems, except nervous, normal.

Nervous System.—Eyes, touch, taste, smell, normal. Left ear shows complete disappearance of drum-membrane, with presence of active, though limited, suppuration. Right ear shows marked retraction of drum. Left ear totally deaf except to low-pitch tuning-fork, which is barely recognized by long conduction. Right ear cannot make out tuning-forks, but can hear loud vocal and other sounds at some distance, and watch next to ear. Right ear shows aerial better than bony conduction. In short there is complete nerve deafness of left ear and partial of right. In regard to cerebral conditions, patient performs all ordinary actions in a normal manner. Is able to indicate any desire by gesture, or speech, when within the limits of her vocabulary. Can imitate any action, *i.e.*, there is no amimia or paramimia. Appreciates music, therefore there is no amusia. Can read in three languages, but understands only the words she is familiar with. Can copy, write to dictation, or name an article or desire in writing, and can read and understand what she has written, all subject again to the above limitation. When her speech is misunderstood, she never voluntarily expresses herself in writing. In short, there is no visual aphasia, no agraphia, and no paragraphia, especially of words she is familiar with. Hearing is very limited, both actually and in the sense of understanding what she hears. It is necessary to speak very loudly and she will repeat only the words she is familiar with: other words she will replace by words she knows nearest in sound to those uttered. In fine, there is auditory aphasia and paraphasia to some extent.

Motor speech is present, but her vocabulary is very limited, and her

articulation very defective, but this is not due to anarthria, as the muscles of speech are not involved. There is rarely any tendency to miscall anything when speaking voluntarily, so that there is practically no paraphemia. When she errs in any of the above functions, she seems to realize it.

There is no muscular paresis or spasm, no disturbance of motion, sensation, co-ordinaation, reflexes, or electrical reaction. The cranial nerves with the exception of the 8th pair are normal. Subjectively there are no sensations, excepting occasional noises in the head, which may be due to the condition of the ears.

Diagnosis.—We have to differentiate here between paralysis of the 8th nerves, bulbar palsy, pseudo-bulbar palsy, thrombosis, apoplexy, embolus, involvement of island of Reil, cortical encephalitis due to some acute condition as meningitis, trauma, and abscess of the temporal lobe of the left brain.

Paralysis of 8th pair is ruled out by the fact that deafness is not total, and that dumbness was simultaneous with deafness instead of being preceded by a period of paraphemia. Bulbar palsy is excluded by above reasons, plus the fact that no other centres were involved. Pseudo-bulbar palsy is excluded for reasons similar to above, both bulbar and pseudo-bulbar palsy would be associated with paralysis of the muscles of articulation, which in this patient are normal.

Thrombosis is excluded by age of patient, febrile onset and character of lesion. Both in this, in apoplexy and in embolism, the lesion would have to pick out cortical areas in a most remarkable manner without involving a single fibre outside the auditory and motor centres, conditions which are practically unheard of. Were the lesion caused by these conditions anywhere beneath the cortex, you would get subcortical aphasia, which would not cause total or instant dumbness and there would be bilateral hemiplegia or monoplegia, none of which conditions exist. In addition, one would expect a diseased heart to account for embolism.

Involvement of island of Reil would not have caused instant deafness and certainly not instant dumbness: there would have been paraphemia. Besides, it is hard to account for an acute condition, not involving other parts as well as the island: cortical excephalitis of an acute nature would have left some other indications in the way of paralysis, spasms, paræsthesias, etc. Trauma—of this there is no history, nor external indication. Abscess of the left temporal lobe is no doubt the condition here, and it is due to extension of inflammation from the left ear. In addition there was probably some direct involvement of Broca's area, for mere involvement of the auditory centre in the temporal lobe would have been fol-

lowed not by instant deafness, but by a period of paraphemia first.

Her present condition following the total deafness and dumbness at the beginning indicates that there has been a re-education of the right hemisphere to take on the functions of the left. In this connexion an interesting question arises. Since her visual and graphic centres were not involved with re-education, would these continue developing on the left side, while motor and auditory functions were being built up on the right, or are all the centres of necessity so closely connected that they must all be on the same side of the brain? Unfortunately this question would involve considerations altogether beyond the scope and limits of a mere case report and must therefore, for the time being, be abandoned.

Prognosis.—Prospects of further improvement rather poor on account of patient's age.

Treatment.—Re-education along lines already adopted, but in much greater detail. Patient should be taught letter by letter, syllable by syllable, word by word, everything being patiently shown or repeated over and over again. Things and their uses should be indicated and then put into words, patient being encouraged to repeat. The other senses should be called into play to the utmost to help along the lagging ones. In addition the ears should be treated until all signs of active disease are eradicated, and an instrument now used, in the nature of a portable telephone, should be carried by the patient to help the defective hearing.

MEDICINE IN CANADA.

BY

M. C. CHARLTON.

III.

In the last article reference was made to a valuable paper "On the Medical Statistics of Lower Canada," by Dr. Kelly. As far as we know he was one of the first to undertake such an investigation. He obtained his information chiefly from the journals of the House of Assembly, and not from the Parochial Registers in manuscript, which had been carefully kept by the clergy. By the census of 1831, the total number of persons in the province was about 554,321. Deaf and dumb, one in 1,244, and the proportion of insane was one in 549. In trying to trace the diseases which caused such an increase of mortality during the summer months at Quebec, he visited the Hotel-Dieu and the General Hospital. Dr. Kelly was, however, disappointed in obtaining the information he sought, as persons suffering from infectious diseases were not admitted.

He next visited the Emigrant Hospital, the records had, however, been so badly kept in the early days that he could obtain but little information. Most of the mortality among the immigrants appeared to be from fever and dysentery. Later, smallpox and cholera carried off hundreds.

Through the kindness of Dr. Skey, Dr. Kelly obtained access to the medical records of the army. And he says: "As the information they contain is most accurate, and as the health of the troops in each year bears a relation to the general health of the province, their records are very valuable in assisting us to form an opinion respecting the diseases of the different seasons. The following table shows the hospital admissions and deaths in the army in Lower Canada, during each quarter of the year, from 1820 to 1827:—

1820 to 1827	Fevers		Pneumonia		Rheumatism		Phthisis and Hemoptysis		Catarrh Acute and Chronic		Dysentery and Diarrhœa		Other Diseases		Total	
	Admitted	Died	Admitted	Died	Admitted	Died	Admitted	Died	Admitted	Died	Admitted	Died	Admitted	Died	Admitted	Died
1st Quarter	332	10	246	5	101	0	41	20	349	5	109	1	1808	15	2986	56
2nd "	747	3	328	14	163	0	39	27	365	3	176	0	2034	11	3852	58
3rd "	1051	9	189	9	158	0	21	17	245	1	659	1	3057	23	5380	60
4th "	539	13	216	2	128	0	29	10	274	1	251	0	2214	17	3651	43
Total....	2669	35	979	30	550	0	130	74	1233	10	1195	2	9113	66	15869	217

"The greatest number of deaths from diseases not specified were 14 from apoplexy; 8 from smallpox; 6 from enterites; 6 from dropsies: 6 from wounds and accidents, and 4 from atrophia." Then he goes on to say that the mortality from pneumonia was greater in the spring and summer than in the winter. In a second table showing the different diseases in all the military hospitals in Canada from 1810 to 1822, we find that the deaths from consumption bore a much smaller proportion to the whole mortality, than from 1820 to 1827. His further remarks on consumption are worthy of note, as this is probably the first instance of any statistics of the disease being recorded.

"The deaths from phthisis in the army in Canada from 1820 to 1831 was 33 per cent. of the whole mortality. In the first period the amount is under 10 per cent., in the last 34. Excluding from the former the returns of 1812 to 1815, when the war and its consequences added so much to the whole mortality. The proportion of deaths from phthisis is still only 12.6 per cent. As it seems very difficult to account for such a disparity in the proportion of deaths from phthisis in men under the same circumstances, we might suspect that it arose from diseases of the

chest not being so accurately distinguished formerly as they had been of late. But, if any error in this respect existed, it would, most probably, be rather in applying the name of consumption to diseases which do not strictly come under that head than in withholding it, and so far would tend to lessen rather than increase the disparity.

If, in order to avoid any error which might arise from this cause, the deaths from all diseases of the chest in both periods are compared, they are found in the first to be 29.2 per cent. of the whole, but deducting the period of war, as before, 43.5 per cent. Thus, whatever the cause may be, the deaths from pulmonary disease appear to have increased." In Dr. Kelly's closing remarks he deplores the high death rate in the towns of Lower Canada. In what condition then were these towns? The city of Quebec was considered healthy and but little attention was paid to hygienic matters. Nevertheless, when a comparison was made between the high death rate in the town and that of other places, this illusion was dispelled, and with the dread of cholera and small-pox before them, the authorities began to pay more attention to hygiene. The public sewers were in such a disgraceful state that some of the houses in the principal streets were at times scarcely inhabitable. In the lower town matters were worse, as many of the sewers from the upper part emptied into the streets of the lower town in a most offensive way. The streets were disgraceful, there was but little lighting, and no general system of policee. There were no night police and murderous attacks frequently took place—so much so, that at last some of the citizens formed themselves into a band and patrolled the streets at night, until matters were in a better state.

The dread of epidemics roused the people to the true state of affairs, and they demanded that the streets be paved and kept in a cleanly manner and that a better system of drainage be applied. They also asked that water pipes be laid through the town. "If Montreal could have pipes, why not they? The cause no longer held good that the severity of the cold was such as to prevent this being done."

Hygienic matters in Montreal, were about the same as in Quebec. The same ill-paved streets and bad drainage. As regards a supply of water Montreal was better off than Quebec, for as early as 1801 the first water pipes were laid. These pipes, when taken up years later, were found to be in good preservation. They were made of spruce logs about six feet in length; the ends of the logs were so cut as to be wedged into the larger end of the next log. By 1839, Montreal had one of the best water supplies of any city on the continent. Some of these pipes have lately been presented to the Hygiene Museum of the Medical Faculty of McGill

University. They were dug up during the widening of St. Antoine street.

In 1842 a new system of drainage was commenced. The opening up of the old drains greatly increased the city's death rate at the time. After the laying of the new drains, the city was thought to be nearly perfect, for we read: "The city is now a city of splendid cleanliness, vying ing with those in America and Europe." They must have had poor ideas in those days of what perfection of cleanliness meant, for Montreal never had any claim to rank in that respect with the cities of the United States, which have always been models of cleanliness.

In 1815, part of St. Paul street was lighted by lamps; by the end of the year the whole street was thus lighted, and Notre Dame street soon emulated the example of its neighbour. It was not, however, until 1836 that the streets were lighted by gas.

These sanitary measures were only brought about after the most strenuous effort of the medical profession. They had a constant battle with the authorities about the drainage and cleanliness of the streets. If more attention had been paid to sanitary matters, the loss of life from the epidemics would not have been so heavy. The greatest of these cholera epidemics commenced in 1832 and lasted until 1854.

The epidemics commenced either in June or July, and ended, with one exception, in August. That of 1832, as an epidemic, lasted till September 15. It was by far the most fatal of all; the mortality in Montreal was 1,895, and in 1834 it was only 912. The deaths in 1832 being more than twice that of the second.

The Board of Health of Quecbec, excluding, we suppose, the immigrants, reckoned the mortality in the two years thus:—

In 1832..	1,607
In 1834..	1,187

The authorities were not unprepared for the advent of cholera. During the winter of 1831-2, a severe epidemic of cholera had broken out in England. The home government had therefore warned the provincial executive that with the opening of navigation the cholera would certainly be brought to their shores. Money was at once voted by the provincial executive, and an island thirty miles below Quebec (Grosse Isle), was set apart by them to be used as a quarantine station. By the twenty-ninth of May, a number of temporary buildings were put up to be used as hospitals, and the island placed under military command.

The Canadians awaited with gloomy forebodings the arrival of the first ship of the year. Their feelings were still further depressed by an

unusually cold and damp spring. These gloomy forebodings were alas! but too fully realized. On June the 8th, the ship "Carrick" arrived from Dublin with 133 passengers, 59 of whom had died from the cholera on the passage. Strange to say, that before any of the passengers from the "Carrick" could have possibly reached Quebec, the plague had already broken out there on the 9th, and on the 10th appeared in Montreal.

SOME PRACTICAL CONSIDERATIONS IN DEALING WITH PULMONARY TUBERCULOSIS.

BY

J. H. ELLIOTT, M.B., Toronto.

When the Committee in charge of this Tuberculosis Exhibition, did me the great honour of extending an invitation to give an address this evening I had considerable difficulty in deciding upon what phase of the tuberculosis problem I should speak. The subject is a very broad one, and there is a wealth of material available upon which to base an address. I have thought it wise not to speak upon the purely medical aspect of the disease, nor in a technical manner to deal with some of the many phases of pathology and treatment, but rather to say in a few words something of the extent of tuberculosis in Canada, and to discuss some of the methods available in dealing with the disease, endeavouring as far as possible to confine the latter portion of my remarks to some of those questions constantly arising, which have to be met daily in dealing with tuberculosis patients and their families.

A great Tuberculosis Exhibition in Montreal makes a further step forward in efforts being made in Canada to combat tuberculosis. Your local association has been doing good work amongst the tuberculous poor of the city, a work with far reaching effects, for it necessarily has exerted its influence amongst the well-to-do, and many lessons have been learned directly and indirectly. The good done by such an association is incalculable, and you are to be congratulated upon the effort you are now making to create further interest in the work you have in hand. The cities are naturally the leaders in all antituberculosis work. It is amongst the poor of the cities that the ravages of the disease are most marked, and here the most effective work can be done.

In many of our smaller towns, and in country districts there are no poor consumptives; in others the poor can be counted on the fingers of one's hands, and the problem confronting us there is entirely different to that presented in a large city with its congested districts and large pauper populations.

Tuberculosis in Canada.

Let us consider for a moment the incidence of tuberculosis among our Canadian people.

The mortality statistics of the Dominion census form the only source of information as to the deaths from tuberculosis throughout Canada. Some of the Provinces have registration but the systems are not uniform, consequently we must rely upon the census for our information, as this gives no absolute uniformity. The last census was taken in 1901:—

DEATHS FROM TUBERCULOSIS BY PROVINCES.

Province	Deaths		Deaths per 100,000 pop.	Total Population
	Male	Female		
British Columbia	171	115	160	178,657
Manitoba	167	215	149	255,211
New Brunswick	266	273	163	331,120
Nova Scotia	451	460	198	459,574
Ontario	1593	1951	162	2,182,947
Prince Edward Island	105	119	217	103,259
Quebec	1391	1982	205	1,648,898
Territories	187	213	252	158,940
Unorganized Territories	33	17	95	52,709
All Canada	4364	5345	180	5,371,315

This table shows that in 1901 there were 180 deaths from tuberculosis per 100,000 population. In England and Wales for the same period the death rate was the same 180.5 per 100,000. In the United States (registration area) it was 196·9 per 100,000 and in the State of Massachusetts 234.5 per 100,000.

Estimate of Deaths from Tuberculosis, 1907.

Since the census of 1901 there has been a marked increase in our population. Hence, these figures of total deaths do not give us an adequate picture of the present yearly number of deaths from tuberculosis. In 1906 a special census was taken of Manitoba, Saskatchewan and Alberta. This showed an increase in population of 745,329 over the census of 1901. In a recent Provincial report there is an official estimate of an increase of 200,000 in Ontario in the same period. There has also been an increase in British Columbia and Quebec, justifying an estimate of 6,500,000 population for the Dominion in 1907, an increase of 20 per cent.

The above table shows deaths from tuberculosis (all forms) in 1901 to be 9,709; an increase of twenty per cent. would make the estimated deaths from tuberculosis in 1907, 11,657.

Now let us look at it from another aspect. The total number of deaths from all causes in Canada in 1901 was 81,201; of these 9,709 were registered as due to tuberculosis. One death in 8.36 due to tuberculosis or 119.6 deaths in each 1,000 from all causes.

In England for the same year there were 106.7 deaths from tuberculosis per 1,000 of total deaths, in the United States (registration area) 118.9, and in Massachusette 138.2.

If the proportion of deaths due to tuberculosis in 1901 continues, it means that of our present population of 6,500,000, over 777,500 are destined ultimately to die of tuberculosis.

Yet we speak of tuberculosis being a communicable, a preventible disease,—a disease curable in its earlier stages.

Surely if these figures, these appalling figures, cause us to realize the extent of the ravages of this disease in Canada, we must endeavour to do something to lessen its prevalence, and to save our population from further infection.

The occurrence of the various forms of tuberculosis according to the 1901 census was as follows:

Tuberculosis of Larynx	76
" Lungs	8248
" Meninges.....	266
" Abdomen	269
" Spine	56
" Knee	8
" Glands.....	172
" Other organs.....	61
Cold abscess, etc.	29
General Tuberculosis	524
Total deaths, all forms	9709

The problem before us is, What shall be done to lessen this enormous death rate? I do not propose to outline a comprehensive plan of attack. Let me but say that the physician, the public, the municipality, the Provincial and Federal authorities must work shoulder to shoulder. Koch's discovery of the tubercle bacillus has placed us in a position to know how to fight against the disease, and we can now lay down certain rules and regulations whereby its spreading may be materially lessened. More and more are we learning to recognize that for effectual measures, government aid must be invoked, and without the full cooperation of the authorities charged with the care of the public health little headway can be made.

We are living in a country where responsible government has been established; our municipal officers, our provincial and federal law makers and administrators are responsible to the people, and though in sudden

emergencies our Governments must act without an opportunity of consulting the people, we must recognize that in dealing with a great problem such as the control of tuberculosis, little action will be taken until it is shown that the people desire those expenditures made which will be necessary. There can be little doubt that our Provincees will take the question up at any time that the people demand it, but as yet only a few voices have been lifted here and there, leaving us still much work to do in educating our citizens generally to the crying need for action. Let us once get our people aroused, not only to the need for action, but to the great possibilities of concerted action, and we shall have no difficulty in securing the active aid and co-operation of the forces of government. This is a most important part of the work which lies before us.

There are certain general principles to be followed everywhere in dealing with tuberculosis; yet with varying local conditions the details must necessarily differ; climatic conditions, housing, density of population, average income and a host of other factors enter at once into consideration, making it essential that in any attempt to deal thoroughly with the problem, local conditions must be made the subject of exhaustive study in order to secure the best results with a minimum of expenditure. As I have mentioned, the problem in sparsely settled and rural municipalities is quite different to that in the cities.

Much can be done for individuals by individual effort, but to secure any marked lessening of deaths from the disease we must have the co-operation of our Governments, and a large expenditure of money is requisite. We can hope to do but little unless funds are forthcoming from private and public sources.

We must not deceive ourselves, and think that when we caring for a few tuberculosis patients in a sanatorium or dispensary that we are on the way to meet the disease. It is a much broader question than this. These institutions are weapons in our armament of defence and offence against the foe. They are integral parts of the equipment of an *arsenal* which should be at our disposal.

But others who have addressed you in the course of this Exhibition have discussed the broad lines of attack and defence. I shall endeavour to confine my further remarks principally to the question of the physician as he deals with the individual patient, and the relation of the patient to his physician.

As one travels from Toronto to Montreal, he passes through a country of rich farm land along the north shore of Lake Ontario. In early summer the fields of grain through which one passes for many miles,

are not fields of waving green, but fields of sulphur yellow. Many a farmer has tried faithfully and honestly to eradicate the pest of mustard from his farm and has almost succeeded, only to find the following year that his fields are again infested, either through dirty seed grain or spread from the neighboring farm. By certain methods of treating these fields our Department of Agriculture has demonstrated to the farmer how he may clean his farm. Yet what incentive is there for him to do unless his neighbor does likewise, and together they use only clean grain for seeding in subsequent years. In the presence of infected farms in the neighborhood, and the reprehensible practice of some farmers selling dirty seed grain as clean, a farmer finds it almost impossible to keep his farm clear of this pest. Also, how often have we noticed that when a few roots of mustard have appeared on a farm, it is an easy matter to keep the farm clean if the neighboring farms are clean, but let the weeds alone for a year or two and the farmer is almost helpless in the face of the problem confronting him.

So to is it with the tuberculosis plant when it multiples and reproduces itself in the human system. If we discover it early while it is yet localized we can in most instances prevent its spread, and even eradicate it. But to be successful we must search for it where there is reason to suspect its presence, and not wait until one passing the patient in a railway train can make the diagnosis. When the disease is far advanced and recognizable at a glance, palliative measures are in most instances all that can be instituted.

Again, even as the treatment of mustard fields, and the avoidance of sowing dirty seed grain will clean up a farm and prevent the spread of a nuisance, so will tuberculosis be eradicated if we treat properly all those who suffer with the disease, and so instruct them that they will not carry infection to others who as yet are healthy and free of disease.

Patient scientific investigation has acquainted us with what we believe to be the sources of infection. Knowing the sources of infection, rules and regulations may be formulated whereby spread from known sources may be prevented, and looking at the question superficially it seems an easy one. King Edward, who is deeply interested in the prevention of tuberculosis, has said, and the words ring in our ears again and again, "If preventible, why not prevented?" A very long answer is necessary to fully explain why; we may say we know how to do it, what means to employ, yet such measures as we would suggest may not be practicable and time is requisite to a fulfilment of our work. Some would in answer say, "apathy," and unfortunately we must recognize that this answer conveys much of the truth.

We know that the tubercle bacillus is the cause of the disease; we have been unable to find any evidence of its propagation in nature outside the body of man or animals. Tuberculosis is then a disease which spreads only from one already attacked, and the keynote of prevention is the recognition of all cases of open tuberculosis, that is, those with bacillus-laden discharges.

The question of infection of man from animals cannot be overlooked; all pathologists acknowledge such infections. True indeed, one great leader in the pathology of tuberculosis, Koch, insists that he has yet to be convinced that such infections are frequent, or that when they do occur, are severe, yet the majority of such workers seem inclined at present to consider bovine sources not to be a negligible quantity, and until we know more positively the approximate percentage of such infections in man they insist that we take every possible precaution against the transmission of bovine infection to man, and more particularly to children. In any case we are assured that even with the acknowledgment of such transmission man must still be considered the source of infection in an overwhelming proportion of all cases. Many estimates have been offered of the percentage of tuberculous affections in man due to bovine sources but they are founded either on too small a number of investigations or upon observations not controlled by careful bacteriological research and need not be here quoted.

It is evident then, that to be successful in our work we must leave no stone unturned to locate all cases of open tuberculosis and to see that proper precautions regarding the disposal of bacillus-laden discharges are carried out.

Amongst the well-to-do the physician rarely has difficulty in securing obedience on the part of the patient to any suggestions made, but amongst the poor sanitary conditions are not so readily secured, and on this account it is most important that there be a system whereby such cases may be reported to the local sanitary authority who will see that sanitary supplies are provided for the patient, and will also institute nursing and medical supervision where the patient is not in a position to procure it himself. It is in this work that the physician, the municipality and local philanthropic organizations can work in accord, and no one need feel, that in instituting notification the patient will be subjected to publicity. The municipality must undertake its share of responsibility in the care of those unfortunate enough to be unable to provide for themselves, while upon the physician alone should devolve the task of rendering all patients under his observation amongst the better classes innocuous to those about them.

This brings up another question.—Can proper precautions be taken without making the patient and his immediate family being made aware of the nature of his disease? One must answer most emphatically, "No." There is, or was, a very prevalent belief that once a patient was told the nature of his disease, he would straighway lose heart and begin to fail, that it was very wrong to injure the patient's sensitive nature by acquainting him with the facts before the time that it would became evident to him himself. It has been necessary for me to make known to hundreds of patients a diagnosis of tuberculosis, yet I cannot recall an instance where harm has resulted. Necessarily the truth must be told in as kindly a manner as possible, and the patient must be made aware of the possibilities of treatment, where he will co-operate with the physician. Harm can result in simply telling a patient he has consumption—this must be qualified by careful statements regarding the nature of the disease and its own inherency to become closed or quiescent, and, of course, the physician will then take the time necessary to give the patient an intelligent grasp of the task before him. A patient cannot be dismissed with a prescription for medicine and a few words of advice. A careful talk is essential and the information necessary to the patient cannot be given in a few moments—time must be taken and the patient's daily routine carefully, outlined, as well as full and definite instructions for the disposal of the sputum and avoidance of infection.

Fear of Infection.

In giving these instructions we must emphasize the danger of careless habits in sputum disposal and in soiling articles with mouth secretions and excretions. I need not go into the details of this, the subject has been thoroughly discussed again and again, and the rules are simple. But I do wish to say a word on behalf of the careful patient. It is not sufficient to alarm the patient and his friends as to the damages of infection. In every instance it is only due to the patient that we assure him and his friends that the possibilities of danger are only present where these precautions are not observed, and that the tuberculous person need be no menace to those about him. Our profession can do much to make the lot of the consumptive a happier one, and can relieve many unwarranted fears by judicious counsel and advice. I have seen a young man refused a bed in his own home, his father a wealthy man, because of inordinate fear of infection of younger members of the family. Let us cause the careless patient to feel he is a danger to the community, but let us keep the careful, conscientious one and encourage him

in his endeavours, and at the same time cause him to be appreciated and cared for by those about him. Let them feel that in assisting him and making his burdens lighter, they are not exposing themselves, but are associated in the work of his recovery.

The Communication of Tuberculosis.

While speaking of the possibilities of the communication of tuberculosis from man to man, it would not be amiss to refer to some recent important and interesting communications on the excretions of bacilli from the body. Investigations made at the Phipps Institute have shown that in advanced pulmonary tuberculosis bacilli are present in the urine in a large proportion of cases, quite irrespective of the presence or absence of tuberculosis of the genito-urinary tract. Inoculation of the urine into guinea pigs showed tubercle bacilli in the urine in 82.5 per cent. of their cases of pulmonary tuberculosis.

Willson and Rosenberger, in their studies at the Philadelphia General Hospital, have shown that in the majority of cases bacilli were demonstrable in both urine and fæces when present in sputum; and in every case of pulmonary and genito-urinary tuberculosis wtih bacilli present in sputum or urine, they never failed to find them also in the fæces. They were also found in the fæces in many cases of glandular and other forms of localized tuberculosis (bones, joints, etc.,) and in acute miliary tuberculosis. They were found in the urine and bowel discharges in incipient tuberculosis of the lungs, showing the infectiousness of excreta early in the disease. In inoculated animals, infected by feeding as well as by hypodemic and intraperitoneal injection, the bacilli were demonstrated in the fæces and urine within the first week. The bacilli discharged in the excreta were found to live in water for over a year. Their presence in excreta has an important bearing on the infectiousness of sewage and of contaminated water supplies.

In connection with this, mention should be made of a paper by Sedgwick and MacNutt. They have made an exhaustive study of the water supplies and vital statistics of three New England cities, two of which had begun to supply their citizens with water much purer than that previously furnished. Hazen has stated that for every death from typhoid fever avoided by the purification of polluted water supplies, two or three deaths are avoided from other causes. These investigators believe that among these "other causes" pulmonary tuberculosis holds an important place. Pneumonia and infant mortality seem also to be included. They are satisfied that "polluted public water supplies ap-

pear to increase the general mortality of communities from tuberculosis; pure water supplies to diminish that mortality." In the city of Hamburg, though the tuberculosis mortality had been declining for years, it is noted that after the installation of sand filters it continued to decline at a somewhat greater rate. No statement is ventured as to whether the decline may be due to diminished infection or to increased vital resistance or to a co-operation of these two factors.

The finding of bacilli in human excreta in cases of closed tuberculosis is corroborated by similar investigations in animals. If a series of cattle which had reacted to the tuberculin test, but were apparently healthy, Schrœder found that 40 per cent. pass tubercle bacilli per rectum with their fæces, and with observations extending over two years the number had risen to over 80 per cent.

We must then recognize in addition to the sputum and the discharges from tuberculous abscesses and sinuses being sources of infection, that the excreta of patients must also be considered. Yet, in the ordinary household, the usual method of disposal allows little chance of infection, so that in the great majority of instances we must consider the expectoration as the dangerous source of contagion, and instruct our patients accordingly. We cannot be too explicit in explaining that anything coming in contact with the sputum and the mouth may be infected, and should be treated as it were so. These objects must be mentioned in detail to the patient—the fork, spoon, and cup, table napkin, handkerchief, possibly the pillow-cover and bed-sheet, if coughed against, and a host of other objects which will readily occur to the physician and need not be mentioned here.

Importance of Early Recognition.

Inasmuch as of incipient cases under proper treatment, seventy-five per cent. will recover, of moderately advanced fifteen per cent. may recover, and of far advanced cases one per cent. may recover, it is a simple mathematical calculation to estimate what it means to a patient to place him under treatment as early as possible.

When a patient presents himself with symptoms of pulmonary tuberculosis a most careful examination must be made in an endeavour to establish a diagnosis. If the physician cannot arrive at a diagnosis positive or otherwise, he should call in consultation a brother practitioner skilled in physical examination and if now in presence of suggestive symptoms a definite conclusion cannot be arrived at, a short wait may be advisable, followed by another examination. In case of uncertainty we have an almost infallable test in the subcutaneous administration of tuberculin.

Its reliability has been amply confirmed by investigations in animals in all countries. I shall refer only to the very conclusive evidence of the Director of the Bureau of Animal Industry, Washington. Of 23,869 animals which have been reacted and have subsequently been slaughtered, 98.81 per cent. showed tuberculous lesions at autopsy. Can any test be more conclusive or more accurate than this?

Just a word of caution—let no physician use the tuberculin test without a wholesome respect for the potency of the drug. A large test dose given to a weak person may produce a very unpleasant reaction, and we have no right to use the test until other means of diagnosis have been exhausted.

If we discover a case of tuberculosis in a family, it is important that the other members of the family be examined for evidence of disease. In this way we may find disease while in the incipient stages and while recovery may be secured; in other cases evidence of infection may be recognized before symptoms appear, and by careful living the patient may avoid a future prolonged illness. In addition to the family, others who may unwittingly have been exposed to infection owing to ignorance on the part of the patient of the infective nature of his sputum, should be subjected to examination. I have known two young men to develop tuberculosis when working in an office on a set of books which had been kept by another man who, not knowing he had tuberculosis, coughed over the books through the day as he was working on them. Other instances could be given of infection in offices and workshops.

The diagnosis being made, the next important point is prompt treatment. No time is to be lost. There must be a thorough understanding between patient and physician to secure good results. It is to be a business partnership, the physician being the expert in the business whose advice regarding all matters is to be sought and carefully followed. The patient must confide everything to him and the physician must be prepared to offer every encouragement possible. He should give the best prognosis consistent with his findings, at the same time giving the patient to understand that the prognosis is only relative to his carrying out strictly the injunctions of his adviser. These must then be given in detail: for many patients it will be found advisable to give written instructions, more especially as to the daily routine to be followed, specifying definitely the amount of walking or other exercise, if allowed, the hours of absolute rest and general instructions as to extra lunches and meals. No half-way measures are allowable. The physician must be firm in his demands upon the patient, who on his part must recognize that the cut-

ting out of his usual pleasures and enjoyments will be his sacrifice in an endeavour to get well.

One of the first questions to decide will be: Shall the patient be treated at home. I cannot undertake a thorough discussion of this question; so many considerations are present in each individual case, and, as in other points of treatment, each case must be considered by itself, for in individualizing lies the secret of pulmonary tuberculosis. We must consider the patient's financial condition, whether well-to-do, of moderate means, or poor, his physical condition, whether in an early, moderately advanced, or advanced stage, whether disease is active or quiescent.

It is rarely advisable to send a patient away from home with a high daily rise of temperature—rather treat him at home at absolute rest in the fresh air until the activity has somewhat subsided. This generalization may be departed from if there is a suitable hospital or sanatorium close at hand, or in the care of a poor man with poor home surroundings, if admission to a local institution can be arranged.

Speaking generally, the wealthy incipient case should be sent away either to a sanatorium or some well recognized health resort, and placed under the care of an expert. Here he is in a community where all are living the out of door life and under supervision. Even though his own home is in the country, it is only rarely advisable that he be treated there because of the difficulty, particularly in the winter time, of having him spend the whole day on the veranda, while the other members of the household are spending the day as usual, much of it indoors.

The wealthy patient with moderately advanced disease is preferably treated at a sanatorium or under close supervision in a health resort.

With far advanced disease and a hopeless outlook as far as recovery is concerned much can be done for the wealthy patient at home, and he should be cared for at home, if home and the presence of his immediate family may mean much to him. A patient with few family ties may prefer to spend his remaining days in some mild equable climate where he may live constantly out of doors in comparative comfort.

For the patient with moderate means much the same advice may be given as for the wealthy; he, however, is not in the same position to face a long period of expense away from home, and this must be taken into consideration, particularly if his income ceases with his leaving home. In the far advanced stage it is rarely advisable that he go away. It is better that he use his money as far as possible for his comfort at home.

In dealing with the poor patient we have one greatest problem. It is difficult in any stage of the disease to get our ideal results while they re-

main in their homes. The only satisfactory solution is the provision of hospitals, sanatoriums, day and night camps for their treatment, removing them from their homes, where, often ignorant and careless, each may be a focus for dissemination of the disease. A large outlay is requisite to secure these provisions for the poor of a great city. We can scarcely yet hope to make much progress until this is done. We can in the meantime do all in our power by a campaign of education, through dispensaries and visiting nurses, to awaken the poor to the meaning of the earlier symptoms of the disease and endeavor to improve sanitary conditions about those patients coming to our notice, at the same time making the family thoroughly familiar with approved methods of prophylaxis and treatment in the home.

We must recognize then that the vast majority of our patients must be cared for at home. One of the first essentials for treatment everywhere is that as much as possible of the twenty-four hours be spent in the open air. We may divide our home-treated cases into two general classes. (1) Those whose whole day can be given to treatment. (2) Those who must continue at work. What shall we advise for day quarters and night quarters in the fresh air? Let us if possible arrange for out-of-door living in preference to the well ventilated room. A well arranged balcony, on which the patient may be screened from the prevailing wind offers most advantages. This is preferably upstairs, convenient to the bath room and opening off or near the patient's dressing room, if an ambulant case. Such a balcony may be built for a small sum, or a larger sum may be spent in a desire for space and good appearance. Where little money can be spent it need be little larger than the bed itself, and protected by canvas, need not cost many dollars.

Where this is not provided, and the patient is unable to have it built —the landlord may object—there may be built a veranda or porch on the ground floor which, by wooden or canvas partitions, may be made into sleeping quarters. I have seen a patient arrange this, utilizing some old stone sash, at an outlay of about three dollars.

Where a veranda or balcony is not available there may be space about the house for a tent, or a lean-to may be built, large enough for sleeping quarters and for occupation on stormy days.

Failing this, we must use a room in the house, one with good light and air space, and we may utilize one of the various forms of window tents or sleeping canopy recently devised by Knopf, Denison and others.

There can be no doubt that the amount of work which can safely be done by a cured consumptive, or by a quiescent case still under treatment, is much augmented by sleeping out of doors at night. At the

present time I have under my care quiescent cases of both 'open' and 'closed' pulmonary tuberculosis who are working daily, and who, I firmly believe, are able to keep at work, and in apparent good health only through the fact that they spend ten hours each night out of doors in addition to what time they are able to be out during the rest of the twenty-four hours. Practically all are at indoor work—in offices, warehouses, house work and similar occupations. It is for the working patient in particular that out-of-door sleeping is advisable.

The patient who is spending his whole day out of doors requires that his quarters be made as attractive as his circumstances allow, in order that he may derive a maximum of improvement from his treatment.

We must never forget the psychic element in our treatment. Nutrition is seriously affected in conditions of despondency, discouragement, apathy and other morbid states of mind, and unless this is overcome we can look for little improvement in our patient. The happy, earnest patient is the one who responds most readily to our measures, and we must ever bear in mind that our own energy, hopefulness and convictions of recovery will have a marked influence on the patient, while on the other hand he will be on the watch for any sign of discouragement, or fear on our part which will only result in corresponding depression in him, with, further, a depression of digestion assimilation and other vital functions. The cheerful encouraging physician is a tower of strength and comfort to his tuberculosis patients in their prolonged fight for health.

REST AND EXERCISE.

Amongst the people in general we find a fairly fixed belief that the tuberculosis patient should exercise to the extent of his powers, and that it is only in this way that he can become strong. On the other hand, it is generally believed that rest in bed is weakening, and when we advise a month or so to be spent in bed we meet with strong opposition on the ground that the patient will surely lose strength. Neither of these beliefs has any foundation in fact. We have no better therapeutic measure for reduction of temperature in tuberculosis than absolute rest in bed, and as a rule a marked gain in weight results.

Rest must be insisted upon while there is a daily rise in temperature of one degree or more, but with improvement in nutrition, lessening of cough and return of temperature to normal it may be wise to institute walking and other mild forms of muscular work which will not induce excitement. But these must always be begun in a very moderate way, and increased gradually, always under the physician's watchful care and with accurate thermometric observations. I think there can be no doubt

of the great therapeutic value of carefully supervised exercise in the quiescent case. On the other hand, there is no folly so great as to allow or to advise exercise with a marked daily rise of temperature.

The dietary must be abundant while body weight is below normal, and while gaining in weight we often see a patient eating with relish quantities of food greater than that required by a hard working man. It is during this time that we desire to maintain what is usually spoken of as overfeeding. With weight reaching normal and a cessation of daily waste through fever and expectoration the appetite naturally becomes more normal, and there should be no desire on our part to force the patient, but only that he will take sufficient of a mixed dietary to maintain his gain.

Then, too, there can be no fixed dietary for the tuberculosis patient. Each patient is an individual with his likes and dislikes, and the physician must direct accordingly. There is perhaps no more difficult task in a physician's work than the arranging of a suitable diet for one with idiosyncrasies towards food and for those with gastric disturbances. The problem will tax the resources and patience of any man at times, but the careful physician will realize how much of the success he hopes for depends upon digestion and assimilation.

It is impossible to discuss the question of medicinal treatment. Judicious medication can do much good. Careless or routine administration of medicine is sure to produce harmful results. Our treatment is constitutional and symptomatic, requiring the physician's careful attention.

We are again in an era of specific medication for tuberculosis in practically all of its forms. No physician to-day can afford to be lacking in a knowledge of the proprietics and the administration of the tuberculins. Tuberculin, speaking generally of the various preparations from the tubercle-bacillus and its products, is a most powerful substance. We have only to remember that in a susceptible individual as small a dose as 3 one-millionths of a grain may induce high temperature headache and general malaise for 24 to 72 hours.

In America, Trudeau and his circle of workers at Saranac Lake have been using it persistently and consistently since it was first brought forward by Koch in 1890, even though it was discarded by almost all other workers. As the result of many years of careful work, methods of its administration have been elaborated which do not produce the untoward symptoms seen in the early days of its use. Dr. Trudeau refuses to wax enthusiastic in its use, as do many of the men now using it, who have but a fraction of his experience with it; yet we gather from his

writings and addresses that he is satisfied that carefully given and in suitable cases the patient's recovery is not only hastened, but is apparently more permanent; there is less probability of a subsequent outbreak of the disease. In expressing his opinions Dr. Trudeau is most conservative, yet we believe that he has more confidence in tuberculin than he as yet feels he may express.

Tuberculin has apparently come to stay. It is not a specific in tuberculosis, yet we may have hope for an improved tuberculin which may prove a specific in pure infections with bacillus tuberculosis. We can scarcely hope to find one specific in advanced disease with mixed infection.

Tuberculin giving good results, physicians should understand its administration, or at least its therapeutic possibilities should they not wish to use it themselves. It will only fall again into disrepute if the use of it is not carefully governed.

I want to say a few words on behalf of those whose disease is arrested or healed and who must return to the old occupation, or seek a new one. It is one of the discouraging features of work amongst the poor, especially sanatorium treated patients, to see them going back to their old haunts (for in many cases new occupations are not to be found), only to relapse and their disease becoming again active. A necessary part of the work amongst the tuberculous poor is to provide out-of-door sleeping accommodation for them in their homes—this is an expense they themselves cannot meet, even to provide the extra clothing they require for out-of-door sleeping in our winter weather is a tax on their resources.

Beside the poor there is another class which we see in the cities and large towns. Young men and women who have returned to their work in offices, making a fair living, but in order to keep well they require large airy rooms or sleeping porches. These they cannot secure in the ordinary boarding house. A great boon would be conferred upon this class by someone who will undertake in each city the construction of a house on the outskirts in a good locality where provision is made for a sleeping porch off each room. It might be started with a moderate amount of money from some large-hearted man, but with proper management could readily pay good interest on the investment. A similar home for those with open tuberculosis but who must remain at work is also desirable, and it would be well, perhaps, to keep these classes separate. I trust that this work will be undertaken soon in many of our cities.

In addition to offering suitable quarters for those with healed pul-

monary lesions, many physicians would gladly refer to such an establishment patients under their care who have cervical adenitis and other closed tuberculosis infections.

Let us, too, in our agitation for sanatoriums for the poor, remember that in conjunction with them we need organizations to look after the family left at home with the father, the source of income, no longer able to provide for them. With the return of the patient, his lesion healed, or disease sufficiently arrested to allow him to take up some work we need a bureau of employment to find such occupations as are compatible with his condition. Take for example, a servant girl who, through a term in a sanatorium in the country or at home under skilled supervision, has become well. What is she to do? Most mistresses on learning where she has been or what disease she has had will not have her in the house and she has a hard time indeed. With a committee to look after such cases, much could be done to overcome this prejudice and to secure such place for the girl as would result in continued arrest of her disease.

We have always to remember that recovery from tuberculosis is more or less a relative term. With other than a limited lesion there is marked anatomical change, with consequent limitations, and though we see many patients restored to full usefulness, the vast majority of those who have had an open tuberculosis, owing to these changes in the lungs and direct or indirect change in other organs, can never hope to do full work again. This is one of our difficulties in dealing with tuberculosis, and brings out the great importance of the *after care* of the healed or arrested case, a great problem second only in importance to those measures by which we hope to arrest the disease. *Our care of the tuberculous must not cease when we close the history form after writing in, "discharged," "returns to work."*

THE

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THE MONTREAL TUBERCULOSIS AND HEALTH EXHIBITION.

We doubt if even those who for some months had been actively engaged in the arrangements, anticipated so remarkable a success for the recent Tuberculosis Exhibition. The idea and the name are not specially attractive. It is difficult to imagine that the public could be attracted by the contemplation of morbidity statistics, of photographs of the consumptive and his surroundings, of plans of sanatoria and models of the same, of shacks and tents, and the like. But the unforeseen has happened. From the first opening the exhibition was crowded by an interested throng and the crowds grew larger and larger until on the last afternoon it was so packed at one time that movement was impossible. Altogether not less than 60,000 persons visited it during the twelve days it was open, or about one out of every six of the population of this city. In short it was a pronounced success and it is difficult to estimate its effect in arousing an intelligent interest in health matters in all sections of the community. For it was open freely to and visited by all classes, from the boys and girls of the public schools (of whom no less than 25,000 were in attendance) to His Excellency the Governor-General.

What we regard as the main reason for this success, apart it may be from the admirable organization both of the exhibits and of the arrangements, in regard to which we shall be making no invidious distinction

if we mention the Secretary, Dr. F. B. Gurd, as deserving of all commendation for his untiring energy, is that the committee would from the first seem to have realized that tuberculosis is intimately dependent upon lack of attention to the laws governing good health in general, that they did not narrow down their work to the one matter of tuberculosis, its prevention and its cure, but gained the hearty co-operation of all the many agencies existing in our midst which devote themselves to improving the health of our people, French and English. The demonstrations in invalid cooking, in nursing, in the care of the teeth, and in house hygiene, were every whit as much centres of attraction as were the exhibits of lungs and other organs the seat of the tuberculous process, the statistical diagrams of the extent of tuberculosis in the city and province and the excellent series of evening lectures delivered by a succession of capable speakers, both from our midst and from a distance.

It was in short a health exhibition, and as such should do more to arouse the community to our existing deficiencies in public and private hygiene than anything that has gone before. We must not, however, be satisfied and self gratulatory over this one notable advance: we must not be satisfied for once to have aroused the interest of the people in these matters; rather this must be made the starting point for active effort along various lines. And we possess the framework for that advance. It may be said that we possess in the provincial and in the municipal by-laws ample powers to protect the people against themselves and against disease. The pity is that the laws, admirable on paper, are scarce enforced. We believe that it is even within our power to enforce notification of cases of tuberculosis. What is needed is that an enlightened public opinion strengthen the hands of the authorities to carry out the laws and by-laws. And here it is most satisfactory to know that we have the cordial support of the whole of the newspaper press of the city. One of the most striking features of the exhibition was the aid given it by the daily and weekly papers, both before its opening and during its continuance.

A notable crusade is being carried on at the present time by the *Standard* in the promotion of a purer milk supply, and already that is having its effect not only on the consumers but on the farmers supplying the city. Remembering the portentous infantile mortality of Montreal this crusade is only second in importance to the anti-tuberculosis campaign. But, we repeat, these are but integral portions of one great movement.

Perhaps the first specific movement to be actually taken in hand for which we would invoke the aid of the press is the putting into activity

of the laws bearing upon house sanitation. Few lessons were more constantly and consistently impressed by the lecturers and by the statistics afforded at the exhibition than the singularly close relationship between high tuberculosis and general death rate, overcrowding and deficient ventilation. What is needed is active inspection of the poorer lodging houses in this city (where overcrowding occurs to an appalling extent), prohibition of employment of cellars, and unlighted rooms, for living purposes, and, in short, the putting into the effect of the regulations which are already upon the statute book, regulations which, when carried out, as in England, have so materially lessened the general mortality. It is, in short, our slums which are the great hot-beds of disease, and there exists no valid reason why we should not immediately inaugurate a progressive policy of rendering them impossible. More than ever is this policy necessary at the present time with the steady influx of the low class and impoverished European immigrant.

Reviews and Notices of Books.

A Text-book of Diseases of Women, by Chas. B. Penrose, M.D., Ph.D., formerly Professor of Gynæcology in the University of Pennsylvania. Sixth Revised Edition. Octavo of 550 pages, with 225 original illustrations. Philadelphia and London: W. B. Saunders Company, 1908. Cloth, $3.75 net; half Morocco, $5.25 net. W. B. Saunders Company, Philadelphia and London. Canadian Agents, J. A. Carveth & Co., Limited, Toronto.

A text-book which has reached its sixth edition in less than eleven years may clearly be said to have met the needs of the class of readers for whom it was intended. That class is the numerous one of the medical student. In his preface the author says: "I have attempted to present the best teaching of modern gynæcology untrammelled by antiquated theories or methods of treatment."

For anatomy, physiology and pathology, readers are referred to general text-books on these subjects. This in a text-book for students implies some advantages. The book is relatively small and handy, and relatively inexpensive, facts which commend it to the average medical student If, however, the dissociation of the pathology of a disease from its symptoms and treatment has the effect of leading the student to regard it as unimportant, the result will be, to say the least, unfortunate.

These criticisms being made, we are pleased to add that the author's claims for his book are amply justified, and that with the medical student

of to-day the book will be as much of a favourite, to judge by its extensive sale, as it has been to past generations of students.

A Reference Hand-book for Nurses. By Amanda K. Beck. Second edition. Philadelphia and London. W. B. Saunders Company, 1908. Canadian Agents, J. A. Carveth & Co., Limited, Toronto. Price, $1.25 net.

A sisterhood of nursing has grown up in the world during the present generation, which is better than a "profession." It is a world of its own, and a very interesting one. A woman who is a nurse is different from one who is not, and different from the woman she was before she began to be a nurse. There is a considerable literature growing up in that world,—literature in the sense that it exposes the minds of those who write it, and creates a body of opinion well knit together. For example, this book is dedicated to Miss McIsaac, whose own book is referred to elsewhere in these pages, and both authors offer opinions which must be taken account of.

This growing authority of the nurse is of importance to the medical profession and to the public. Miss Beck's hand-book contains much information skilfully arranged.

Hygiene for Nurses. By Isabel McIsaac. New York: The Macmillan Company, 1908. Price, $1.25 net.

This book is issued by The Macmillan Company of Canada, which is doing so much to make Canadians familiar with the excellent publications of The Macmillans of London and New York. Miss McIsaac possesses a peculiar fitness for writing a book on nursing. She is a nurse; she has knowledge and sense; and she knows how to write. The book contains sound teaching; it is interesting,—entertaining even.

Diseases and Surgery of the Genito-urinary System, by Francis S. Watson, M.D., Senior Visiting Surgeon to the Boston City Hospital, Lecturer on Genito-Urinary Surgery in the Harvard Medical School, Boston, and John H. Cunningham, Jr., M.D., Assistant Visiting Surgeon to the Boston City Hospital, Member of the American Association of Genito-Urinary Surgeons. In two octavo volumes containing 1,101 pages, with 454 engravings and 47 full-page coloured plates, mostly from original drawings. $12.00. Lea & Febiger, Publishers, Philadelphia and New York, 1908.

During the past few years many text-books dealing with genito-urinary matters have appeared from the publishers of both this continent and

Europe and most, indeed, with a good *raison d'être*. Up to the present the standard works have been almost exclusively continental in origin and to the student unfamiliar with French and German, much of genito-urinary interest and importance has been obtainable only at second hand. While the student's difficulty is not entirely removed by the publication of Watson and Cunningham's book, yet it is minimized.

The book has been long in preparation and bears throughout evidences of careful thought and arrangement; in addition it contains valuable points which no book up to the present possesses to the same degree. To be concise, it is the best text-book in English yet to come before us and covers the realm of genito-urinary surgery in a thorough and extensive manner, due the importance which the subject has attained in recent years. It is useful further as expressing in no equivocal manner the views held by its authors on many disputed points of pathology diagnosis and treatment.

To those interested in disease of the genito-urinary tract, this book will serve as a useful reference, the bibliography is extensive and references are conscientiously made throughout, a fact which considerably enhances its value and raises it above the level of the ordinary text-book. Many articles are treated at length and much statistical evidence collected for or against the points in question. This is especially the case in the chapters devoted to the discussion of bladder tumours and of new growths of the kidneys; to prostatic hypetrophy and subparietal injuries of the kidneys in all of which former publications from the authors have prepared us for the views expressed and have apparently stood the writers in good stead. Tuberculosis of the genito-urinary tract has been collected under one head and treated as an entity: a departure from the ordinary, but one which no one who has interested himself in the subject will call in question.

Applied anatomy, pathology and bacteriology are everywhere in evidence, and the views expressed are conservative and amply supported. The laboratories of the Boston City Hospital have served their turn in this production. We miss, however, the use of culture methods as applied to the differentiation of the gonococcus, methods which do clear up some of the doubts expressed; also we miss a reference to vaccine therapy and congestive treatment in gonorrhœal rheumatism procedures, which, though scarcely established, surely deserve mention in a work of this kind. Again, though the authors evidently rely on cystoscopy and ureteral catheterization, yet the chapter dealing with this subject is not on a par with the rest of the book.

The treatise on the prostate is especially well written and detail is not

lacking; a very fair statement of the history of prostatectomy is given Mr. Freyer is referred to as the "universal usurper of previously pre-empted prostatic privileges:" truly is the book written in Boston.

They strongly advocate surgical treatment of prostatic hypertrophy, showing that the present mortality is but little more than that following the introduction of catheter life.

A very practical feature is the quotation of illustrative cases and a still more useful one is the chapters dealing with operative measures and technique. The book is extremely well illustrated, especially those plates prepared by the authors' artists deserve mention. It is dedicated to Keyes, to whose work many references are made.

The printing and binding are excellent, and with the exception of the one word *clitorises* we have no fault to find with the typography.

Altogether, it is a book which few genito-urinary surgeons will care to be without.

R. P. C.

Diseases of the Genito-urinary Organs and the Kidney, by Robt. Holmes Greene, A.M., M.D., Professor of Genito-urinary Surgery, Medical Department of Fordham University. Genito-urinary Surgeon to the City and to the French Hospital, New York City, and Harlow Brooks, M.D., Assistant Professor of Clinical Medicine, University and Bellevue Hospital Medical School, Visiting Physician to the City Hospital, New Pork City. Second edition, revised and enlarged. W. B. Saunders Co. J. A. Carveth, Canadian Agents. $5.00.

It is scarcely one year since the first edition appeared and was reviewed in these pages. To what we then said we have little to add. The book is considerably enlarged, especially in that part dealing with diseases of the bladder and also in that section dealing with the functional examination of the kidney. Special features are the presentation of the physiology and medical diseases of the kidney written by a physician (Brooks) and the eye complications of kidney disease, etc., by an ophthalmic surgeon (Kalish). It is very concise; only the important diseases receive much attention; nevertheless, applied anatomy and physiology are in evidence. The arrangement of the matter is excellent and considerable space is allotted to the instrumental examination of these diseases. If we must criticize, we should say that such chapters as those dealing with tuberculosis of the kidney and hypertrophy of the prostate are not broad enough in view of modern ideas, and we should prefer a more personal touch in doubtful subjects. The book is an improvement on the first

edition, and the fact that a second edition is called for so soon is evidence that it has filled a vacancy.

R. P. C.

A Manual of Infectious Diseases, by E. W. Goodall, M.D., Lond., Medical Superintendent of the Eastern Hospital of the Metropolitan Asylum Board, and (the late) J. W. Washbourn, C.M.G., M.D., Lond., F.R.C.P., late Physician to Guy's Hospital, and Lecturer in the Medical School. Second edition, revised and enlarged, by E. W. Goodall, London. H. K. Lewis, 136 Gower Street, W.C., 1908, pp. xii and 426, demy 8vo, with 33 plates. Price, 14s net.

This manual appeared in 1896, several years before the lamented death of the senior author, and the present edition has been laid upon the shoulders of Dr. Goodall. The work of revision has been well done, and the reader will be glad to find that the work is absolutely up to date; tested by improvements which have been detailed in the current literature of this year one finds all possible additions made to the text.

The book in its first edition is well known; it will be recalled that in addition to chapters on all the important infectious diseases, there were also several sound chapters upon fever, infection, disinfection, the accidental rashes, and upon sore throat. The plates are good, and the diagrams even better; this statement is made, however, with the reservation that it is easy for one who is familiar with a disease to recognize that a photograph reproduces it, although the same photograph may not be very instructive to a student who does not know the appearance of the disease. We mean to say that human ingenuity has not yet arrived at any way of supplying a substitute for the patient; but as far as one can teach by uncoloured photographs, it is here done. We can unhesitatingly recommend the tone of this book, and say that the second edition is worthily improved.

J. McC.

Arteriosclerosis: Etiology, Pathology, Diagnosis, Prognosis, Prophylaxis and Treatment. By Louis M. Warfield, A.B., M.D., Instructor in Medicine, Washington University Medical Department; Physician to the Protestant Hospital, St. Louis, Mo., etc. Eight original illustrations. C. V. Mosby, Medical Book Co., St. Louis, Mo., 1908.

Dr. Warfield's book is better than it looks; it tends to the "grey paper with the blunt type" style, and deserves better embodiment. Prof. W. S. Thayer, in a short introduction, deplores the indiscriminate popular

use of the word arteriosclerosis, and indicates that we, as a profession, are not careful of our use of it. This is exemplified by the fact that another book lies before the reviewer at this moment, in which the term arteriosclerosis is defined in a way quite different from that in which Dr. Warfield defines it.

There is nothing especially new in the book: the material is well arranged and sequent. Abdominal arteriosclerosis seems to be perhaps made too definite an entity, although many authors have lately so defined it. The best part of the book is a sensible outlook on the entire question and an indication that the author is in the habit of using carefully all the good methods of examination, and when that is done, of thinking sensibly upon his fndings. Thus, a chapter of practical suggestions at the end ,details many things which the physician will do well to remember, especially because the author recognizes how adequate prevention may be and how inadequate treatment.

J. McC.

Atlas of Clinical Surgery for Practitioners and Students, By Dr. Ph. Bockheimer; English adaptation by C. F. Marshall, M.D., F.R.C.S., with 150 colored plates from models, by F. Kolbow, 3 volumes, large 8vo., $8.00 each. The Rebman Company, New York.

The attraction of this extensive work consists in the coloured reproductions of F. Kolbow's models from the Pathologic Institute of Berlin. The models are certainly beautifully reproduced and are very life-like in character. This mode of illustration was first introduced by Parisian dermatologists from the models of Baretta in the Hospital St. Louis in Paris. It is a very graphic way of teaching the surgery of the external parts. The material for the models was supplied chiefly from the clinic of Prof. von Bregmann. In a work where the illustrations are so universally good it is difficult to select any for praise, but special attention might be directed to the reproductions of cutaneous cancer, diseases of the breast, and the surgical affections of the tongue. The text is concise and well arranged, the descriptions of the various diseases are accurate and comprehensive. Mr. Marshall has done the translation well and correctly. The teaching of von Bergmann has been followed throughout and much space has been given to the section on treatment. We can heartily recommend this magnificently illustrated work to all who wish to get a practical knowledge of certain diseases.

GENERAL PATHOLOGY, By ERNST ZIEGLER; translated from the eleventh German edition by ALDRED SCOTT WARTHIN, Ph.D., M.D. William Wood and Co., New York, 1908.

Everyone who has been interested in pathology knows Ziegler, not so much for his researches in this subject, but for the volume on General Pathology which he has written. This book, along with those on Special Pathology, received high recognition and early became the standard text-books. Translations have been made into the English, French and Italian languages. This work, therefore, which has been known to all of us for many years, requires no introduction. With the rapid development of the researches in Pathology, new suggestions, theories and facts had to be recorded and embodied in the text, and this, along with the constant demand for Ziegler's works, has necessitated repeated editions.

As we go over the pages, we recognize many of the earmarks of the early editions, some of them we deplore in not expressing the most recent thought, while some of the plates from former editions are considerably worn. Dr. Warthin has, however, interlarded much of Ziegler's writings with up-to-date views, but we regret that these very important additions have been placed in the less-frequently-read fine print.

Ziegler's work, however, remains a standard to which all can refer, while the extensive bibliography preceding each chapter is most welcome to those wishing to consult original articles. This General Pathology has probably done more to educate the student and practitioner, in the principles underlying pathological lesions, than any other book.

"OBSTETRIC AND GYNECOLOGIC NURSING," by EDWARD P. DAVIS A.M., M.D. Third Edition, thoroughly revised. W. B. Saunders Publishers. Canadian agent J. A. Carveth & Co., Ltd., Toronto. Cloth, $1.75.

This work has proved deservedly popular, this being the third edition issued since its appearance in 1901. The simplicity of style and the very satisfactory arrangement of the work have largely contributed to its success. One great advantage of the book is that it does not attempt to teach obstetrics, but sticks to its subject, that is, nursing of obstetrical and gynecological cases. The work is especially strong on directions for the care and feeding of young children, while the section dealing with the disorders of infancy is very practical and is not too technical.

One notes with interest in the chapter on the development of the child, under the sub-heading "The Care of the Nerves," that the author

speaks of "the fondness of the nurse" as being "a natural encouragement for its growth." He states, very truly, that those who cannot control themselves in the presence of the minor annoyances of life are not fitted to care for children. The work is to be heartily commended not only to nurses, but to junior physicians.

REPORT FROM THE PATHOLOGICAL DEPARTMENT CENTRAL INDIANA HOSPITAL FOR INSANE, By G. F. EDENHARTER, M.D., Superintendent. William B. Burford, Indianapolis.

We appreciate the confidence in laboratory research which the Superintendent expresses in his introductory remarks. Dr. Edenharter says: "were it to fall to my lot to organize and construct a new institution for the care of the State's unfortunate insane, I would build and equip, as an adjunct, a department for pathological and other scientific investigations before commencing the construction of the administration building or kitchen; or in other words, I would deliberately place the new institution in such a position that the reception of patients or other business could not commence until every preparation had been made for the scientific prosecution of the medical work, and this as complete as the most advanced thought and modern methods could make it."

The book gives a resumé of the interesting material which between 1903 and 1906 has passed through the pathological department of this institution of a hundred beds.

PRINCIPLES AND PRACTICE OF MODERN OTOLOGY, by JOHN F. BARNHILL, M.D., Professor of Otology, Laryngology and Rhinology, Indiana University School of Medicine; and ERNEST DE W. WALES. B.S., M.D., Associate Professor of Otology, Laryngology and Rhinology, Indiana University School of Medicine; 575 pages, W. B. Saunders & Co., Philadelphia and London 1907.

This book of over five hundred pages is devoted entirely to otology; as necessary adjuncts to the study of ear diseases, it contains also chapters upon nasal and naso-pharyngeal conditions and upon intracranial complications.

The authors dedicate their work to all English-speaking students and practitioners of medicine. Accordingly we look for the treatment of the subject to be adapted to the use of the beginner as well as of the more advanced.

The chapter on the anatomy of the temporal bone is both well written and illustrated, but there is an unfortunate mixing of the several relationships as they are found in early and in adult life. Useful and

exhaustive tables are to be found at the end of the chapter showing the vascular and nervous supply of the several parts of the ear. When dealing with the physiology of the ear, the authors quote at length from Denker's "Otosklerose."

In the chapter upon functional tests, it must be pointed out that the Schwabach test has nothing to do with air conduction, but consists of a comparison of the bone conduction of the patient with that of a normally hearing individual. With this exception, the details of examination are well and clearly written. The authors devote much attention to diseases of the auricle and external meatus. Acute and chronic diseases of the tympanum and mastoid are treated exhaustively. Following the chapters upon suppurative diseases, come in natural order those upon intracranial complications. Operative methods are described in detail for treating the several conditions. The common but all important conditions of acute and chronic suppuration of the tympanum receive the full notice which they deserve.

The illustrations throughout are clear and good. We think there are too many illustrations depicted, e.g., different chisels and curettes, and too few illustrations of microscopical sections. The proof-readers have overlooked very few mistakes. We may point out on page 350, that silver nitrate solution is recommended in the strength of five grains to the ounce. Those who are fortunate to be in possession of the book, have a valuable store of information especially rich in the anatomical details, in the description of examination methods, and in the setting forth of the commoner forms of otitis.

H. S. M.

TEXT-BOOK OF OPERATIVE SURGERY, by WARREN STONE BICKHAM, M.D., Junior Surgeon, Touro Hospital, New Orleans; late Assistant Instructor in Operative Surgery, College of Physicians and Surgeons, New York; late Demonstrator of Operative Surgery, Medical Department, Tulane University of Louisiana. W. B. Saunders & Co. Philadelphia. Price $6.50 net.

The present volume is the third edition. The work includes surgical anatomy and operative technique involved in operations of general surgery. The author, quite properly, makes no apology for presenting the surgical anatomy for each operation considered. The work includes practically all modern methods, but unfortunately the author does not give his personal endorsement of the particular operation he has found most desirable, contenting himself with describing several methods, leaving the reader to decide which of these should be followed.

In the chapter on methods of treating ununited fracture, no reference is made to the steel plates introduced by Arbuthnot Lane. The reference to the use of Parkhill's Clamp gives no indication of the great difficulty in keeping the clamp in position, and the danger which exists of infecting the deep tissues.

The chapter on injuries to the blood vessels and methods for the repair of the same is well written. The chapter on operations upon the head isespecially good, while in the chapter on intestinal surgery much prominence is given to the use of the Murphy Button.

In the article on radical cure for hernia, no reference is made to the method suggested by Macewen or to that of Kocher, both of which are of value in selected cases.

The book is of twelve hundred pages, profusely illustrated by beautiful plates, a large number of which were especially drawn under the author's direction. The book is made up on very fine paper with clear type. The index is full and very complete.

On the whole the work commends itself from all points of view, and should be valuable as a guide in all operative surgery, including as it does the most recent methods.

J. A. H.

VACCINE THERAPY AND THE OPSONIC METHOD OF TREATMENT, by R. W. ALLAN, M.D.B.S., London. H. K. Lewis, 136 Gower St., London. (Second Edition).

The second edition of this work is revised and enlarged. The author points out the method of demonstrating opsonins in the blood, their nature and constitution, their formation in the body, their relationship to infection when introduced into the system and the methods of raising the opsonic index. The method and technique of determining the opsonic index, the preparation of the vaccines and the method of their administration are explained, and the value of the opsonic index in diagnosis, prognosis, and treatment pointed out.

The different infections by the various organisms are then described: tuberculosis, its etiology, diagnosis, types, and the method of differentiating them; the tuberculins, their properties and actions, and the conduct of cases both apyrexial and pyrexial, in using small therapeutic doses of tuberculin (a) by opsonic methods (b) by clinical signs, and the results so far obtained by such treatment.

The staphylococcus, streptococcus, pneumococcus, gonococcus and the bacillus coli, typhoid, and dysentery groups and the vaccine therapy of catarrh are similarly dealt with, as well as the micrococcus melitensis,

bacillus paralyticans, micrococcus neoformans, meningococcus and actinomycosis.

One chapter is devoted to the vaccine therapy of the various infectious eye diseases and an appendix added in which facts of importance in respect to certain bacteria are pointed out. Special methods for the detection of the tubercle bacillus in sputum, fæces, urine, methods of staining, the human and bovine species and the opsonic index in both types, in various cases of pulmonary phthisis, are thoroughly explained.

THE STUDENTS HAND-BOOK OF PHYSIOLOGY, by the late ARTHUR CLARKSON, M.B.C.M. Ed. Formerly Demonstrator of Physiology, Owen's College, Manchester, and Yorkshire College, Leeds; and DAVID A. TARQUEHARSON, M.B.C.M Ed. T. T. P. & S. Glas, Professor of Physiology, St. Mungo's College, Glasgow; Prof. of Physiology, Royal Dick Veterinary College, Edinburgh; Lecturer on Physiology and Hygiene, Heriot-Watt College, Edinburgh. E. & S. Livingstone, Publishers, Edinburgh. 786 pages. 474 Illustrations. 12s. net.

This is without doubt one of the best text-books of physiology we have seen. It is also one of the smallest of the good books. It has an abundance of good illustrations, including diagrams, cuts of apparatus, tracings and microscopic sections. A feature of the book is that it presents the histological and embryological sides of physiology particularly well. It is written along conservative lines as might be expected from its joint authorship by two Edinburgh graduates. It is said to be the work of the late Dr. Clarkson, with the exception of the chapter on the central nervous system and part of that on the special senses, which are written by Dr. Farquharson.

It is interesting to note the stand taken by the authors on certain questions which are more or less under dispute. They advocate the myogenic theory of the heart beat as opposed to the neurogenic; the solution theory of fat absorption as opposed to emulsification; they suggest a compromise between the so-called vital and physical theories of lymph formation and claim that while the endothelial cells possess a certain secretary activity, the processes of osmosis and filtration play an important contributory role. In relation to the functions of the thyroid gland, they think that much of our supposed knowledge has been upset by the recent experiments of Swale-Vincent and Jolly so that we must almost begin over again. The account of the Pituitary body does not show much acquaintance with Prof. Schaefer's valuable work as recently described to the Montreal Medico-Chirurgical Society. We notice that

the authors exercise due caution in applying the results of experiments on the central nervous systems of the lower animals to man. They recognize, for instance, the dissappearance of the reflexes after division of the spinal cord in apes and man.

On the whole, we may say that the book is thoroughly sound and authoritative and represents a well-balanced judgment on nearly all important physiological questions.

W. S. M.

Medical News.

Dr. Wishart, who has been lately appointed Chief of the Ear, Nose and Throat Department of the Toronto General Hospital, has on that account resigned his position as Chief of that Department in the Hospital for Sick Children, which has devolved upon his Junior in the Service, Dr. Geoffrey Boyd.

Dr. Wishart has been elected a member of the Royal Society of Medicine, England.

The forty-second annual meeting of the Canadian Medical Association will be held in Winnipeg, on the 23rd, 24th, and 25th, August, 1909. The Chairman of the Local Committee of Arrangements is Dr. H. H. Chown, Winnipeg, and the Secretary Dr. Harvey Smith, Canada Life Building, Winnipeg. The President is Dr. R. J. Blanchard, Winnipeg; and the General Secretary, Dr. George Elliott, 203 Beverley St. Toronto.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The fourth regular meeting of the Society was held Friday evening, November 20th, 1908, Dr. J. Alex. Hutchison, President, in the Chair.

APHASIA, AUDITORY AND MOTOR, WITH RE-EDUCATION.

N. Viner, M.D., presented this case before the Society.

Colin K. Russel, M.D.—This has been a very interesting case to listen to, but I do not think Dr. Viner has entirely excluded middle ear disease, a common cause of deafness in early childhood. It is known that a child, especially of that age, just beginning to talk, may become entirely dumb after a short period of deafness. Apropos of Dr. Viner's

remarks with regard to the involvement of the graphic centre and the motor speech centre, a week or so ago I had the opportunity of seeing a patient who was an educated man, in fact he was a first year medical student, who got injured over the temporal region. He had an almost pure motor aphasia *i.e.*, he could not express himself in words, and at the same time, though he could write almost anything he wished to say, and he understood what was said to him almost completely, and could understand simple written instructions, he had a certain amount of intellectual impairment. This bears out Marie's contention regarding aphasia that the centre in the first temporal convolution is more that of an intellectual centre and the others no speech centres at all in the true sense, but mere collections of cells with motor functions. He could understand most things said to him, so that the auditory deafness was not at all extreme; yet there was a certain amount of intellectual impairment. He could not understand involved sentences and he could not do any involved arithmetic, etc. It was interesting in this case, too, to note that there was evidently a graphic centre apart from the motor speech centre.

N. VINER, M.D.—In reply to Dr. Russel's suggestion that the condition might be accounted for by a peripheral deafness I would say that: 1, such deafness would have to be total and bilateral; 2, it might, or might not be followed by motor aphasia; 3, seeing that according to Dr. Russel's hypothesis the motor cortex had not been involved, should motor aphasia supervene it must, of necessity, be preceded by a period of paraphasia or, as some would term it, paraphemia. Again, admitting the presence of nerve deafness, total in the left ear and partial in the right, how would one account for the partial restoration of hearing in the left ear, especially as such restoration took place at nine years of age and has not improved since then? (Adenoids generally do not atrophy at nine years, nor does regeneration of nerve start and cease suddenly). In short, granting the nerve deafness, one can explain it as due to the same inflammatory ear condition which ultimately invaded the left temporal lobe and probably Broca's area adjoining. What return of hearing there has been is due not to the conducting channels, *i.e.* the auditory nerves, but to the receiving apparatus, namely the perceptory apparatus in the temporal cortex—of the right side. This would lead us to the conclusion that the right auditory nerve was never totally deaf.

POTT'S PARAPLEGIA CURED BY THE PLASTER BED.

J. APPLETON NUTTER, B.A., M.D., presented this case before the Society.

W. G. Turner, M.D.—Dr. Nutter is to be congratulated on the good results he has obtained in this case. What strikes one is the simplicity of the treatment and also the simplicity of the apparatus which makes it more or less applicable to any outpatient case. In these early cases the prognosis is very good, and it strikes one that in all cases, even when the paraplegia is marked and almost with complete loss of power, even in these where the patient is followed up and constantly under supervision, very good results may be obtained.

J. Alex. Hutchison, M.D.—I think the Society is much indebted to Dr. Nutter for arranging to bring such a small child before the meeting, and we are very grateful for the trouble he has taken.

THE CUTANEOUS MANIFESTATIONS OF TERTIARY SYPHILIS.

G. Gordon Campbell, M.D., read a paper on this subject.

E. M. von Eberts, M.D.—I would like to ask Dr. Campbell what his practice is with regard to the continuance of iodide after the lesions have healed, whether in the absence of a history of a thorough mercurial course the iodide is continued for a year or more, as recommended by some authors.

In connection with the remote reminders, of which Dr. Campbell has mentioned a case after 30 years, I would like to cite a case which came under my observation five years ago. The individual had been in New York as a drummer boy in the Northern army shortly before the Battle of the Wilderness and while there he was exposed. Two weeks later there developed a sore which became indurated. The army doctor told him that he had "the pocks," and without waiting for secondary symptoms, gave him mercurial pills, which he took for a period of six weeks. He had no recollection of any secondary symptoms. Thirty-four years later he developed an eruption over the right eyebrow in the course of the supra-orbital nerve. Without consulting a doctor he took six bottles of a "Sarsaparilla," (which contains potassium iodide), and the eruption disappeared. He came to me the following year with a recurrence, having been told by his family physician that the condition was cancerous. Under iodide of potash the lesion had almost completely healed at the end of 10 days. The interesting point here is that he had been free from all symptoms from the time of infection till 34 years afterwards. The case is one also in which the course of the mercurial treatment was decidedly curtailed.

A. G. Morphy, M.D.—I should like to ask Dr. Campbell if he ever found any symptoms of coryza in his administration of the iodides, and whether he found, as claimed by some, that the coryza disappeared when

the dose was increased. I have read of such a thing, but have not come across it. I should like to ask also if Dr. Campbell would give a brief account of his treatment of the secondary symptoms, as regards the administration of mercury, whether by pills, inunctions or hypodermically, and for how long a period at one time he gives the drug.

A. R. Pennoyer, M.D.—I would like to ask Dr. Campbell, although digressing from the strict tenor of his paper, with regard to the diagnosis of syphilis. At the present time I take it that although the spirochætæ is positive evidence of a case being syphilitic, the absence of it does not negative the possible presence of the disease, and there are certain cases, we have all seen them, where we would like to know how much evidence one has to have in order to decide as to the nature of the condition. If, for instance, in a case like this, which came to me during the past week: A young man who had gonorrhœa three years ago, who was cured in a short time and had no untoward effects from it. For the past six weeks however, he has been treated by a homœpathic physician for a condition of the throat and he came to me to see what I thought of it. There was an ulcer spreading from the left tonsil upon the left anterior pillar, another on the right side and three on the soft palate. This led me to go into the history rather carefully, and on examination I found he had enlarged cervical glands, those in the back of the neck rather hard, the inguinal glands enlarged and over the front of the upper arm and extending on to the shoulder and more or less on the body was a macular rash in association with which there was very evident brownish stains. Now, if one could not find the spirochætæ from a scraping from these ulcers, would it be regarded as good practice to tell this man that he had syphilis, and put him on antisyphilitic treatment?

I would also refer to another case I had four years ago (Dr. von Eberts also saw the case with me). This man gave a definite history of syphilis six years previously for which he had been treated by a professor in Stockholm for a period of over six months, who told him that the treatment was so thorough that he could pronounce him cured in that time. Here in Montreal after a subsequent exposure he developed a regular soft sore and, with this history of syphilis, knowing that it is of rare occurrence to have a second infection, I at first regarded it as chancroid and treated it as such for six or seven weeks. It spread and I had come to the conclusion that it was malignant, but before taking a snipping from the sore for examination, I put him on a course of iodide in large doses and in ten days it was all cured. Here was a definite case of tertiary lesion, on the genitals.

G. P. Girdwood, M.D.—What strikes me in Dr. Campbell's paper is

the number of cases where one recognizes the tertiary form of the disease without history of previous infection. Is it possible that the tertiary form may be communicable, or even the secondary form, without a previous contagion? This has been a moot point for many years, that is, its communicability in these stages without a previous condition of infection. I rather believe it is, that you may communicate this disease without having primary sores.

J. Alex. Hutchison, M.D.—I should like to add a word to confirm the view held by Dr. Pennoyer. It does seem surprising that cases of this nature are overlooked, and I think possibly the explanation may be that we follow very largely the belief that was present in London many years ago, where it was assumed that every case that came to the outdoor was syphilitic until it was proven to be otherwise. I think all hospital men are rather of that view, so that the recognition of these conditions comes easier to us than it would to a man in a small place where the disease is not so well known and recognized. The point mentioned by Dr. Pennoyer is a very interesting one, one does not always see the primary sores before a general constitutional condition has taken place.

G. Gordon Campbell, M.D.—With regard to the length of time for keeping up administration of the iodide, it has been the rule in hospital practice to keep it up for 6 or 7 months at least, if the patient attends. It is very rarely that the patient will come back after the signs of the disease have disappeared. In those cases where we have kept it up the disease has not recurred in any I have been able to follow for 5 or 6 years. The patient with the ulcer on the left shoulder of which the photograph was shown was a most interesting case. He was in the hospital while I was house surgeon there in 1889 with a lesion on the shoulder and on the forehead. He was treated until they were completely healed and we did not see him again until he walked into the medical clinic five years ago with symptoms of cerebral syphilis, paresis, etc., suggesting a syphilitic tumour of the brain. On having him stripped I recognized the healed ulcer on the shoulder. He died from the disease of the brain. Here the disease did not return in the skin. The general opinion of dermatologists is that the iodide has no curative effect on the disease itself, but has the remarkable power of causing the absorption of the granulomata; and that it is wise after the lesions have disappeared to give a course of the mercurials as a preventative against recurrence. I may also say that the iodide does not seem to have the same effect on visceral lesions as it does on the skin. It is notorious that patients who come to the hospital with the so-called leucoplakia and ulcers of the tongue, recover from the skin lesions at once, but with the

tongue the disease may last for years. I have one patient where I have tried to keep down a lesion of the tongue for years, and yet it will return while the skin eruption has never returned. With regard to the production of coryza it is very seldom one gets an intolerance of the iodide in the tertiary syphilitic. When it does occur it is very annoying to have to stop the treatment. I have never administered the iodide in any but the one way, that is in large doses. So far as the treatment of secondary syphilis goes, my own plan is to state to the patient plainly that it is a serious disease, and in most cases tell him what it is and that he can be cured if he takes treatment for three years. If first seen during the primary period, I ask the patient to await further symptoms and tell him what the secondary symptoms will be, so that if he doubts my decision he may be convinced that he has the disease before beginning the treatment. There is no difficulty then in inducing him to carry it on for three years. We have tried all the different forms of administration of mercury except fumigation. The inunctions are certainly most rapid, and if they can be carried out by trained attendants they are very effecual. The simplest method is to use Hutchinson's pills, grey powder,—3, 4, or 5 pills a day until the lesions disappear. The patient gets a sufficient supply to last for a considerable time, and I generally tell him to take the medicine from the 1st to the 20th day of every month. This is easy to remember and allows ten days entirely free in every month. When I was first connected with the clinic the proto-iodide pill was the popular one and we used it in every case, but both Dr. Shepherd and myself came to the conclusion that there were more cases of tertiary lesions after this compound than with the metallic mercury pill. In the matter of diagnosis, failure is mainly because of the fact that one places too much importance on the absence of a history of syphilis. In doubtful cases such as Dr. Pennoyer has mentioned, the appearance of the ulcer alone would suggest either a late secondary or a tertiary syphilide. A short course of mercury would immediately show whether it was syphilis or not. In reference to Dr. Girdwood's remarks about whether the tertiary form was communicable, I believe it rarely is, but that it must be in some cases is evident now that the spirochætæ have been found in tertiary lesions, and if that is so they must be communicable. We have syphilis of the third generation, and we could not have this unless such communicability did occur.

THE ORGANISM OF RHEUMATISM.

A. H. MacCordick, M.D.—Demonstrated the specimen.

F. G. Finley, M.D.—I think this observation is a very interesting

one. In my service attempts have often been made to obtain cultures from the joints and blood of rheumatic patients, but have hitherto failed. I would like to know if it is possible to increase the virulence of the pneumococcus so as to produce pathological effects.

C. W. Duval, M.D.—Dr. MacCordick's case is of great interest in that he obtains an organism from various parts of the body which, in my opinion, resembles that described by Poynton and Payne. I have tried to isolate their organism from the joints of acute articular rheumatism, but have always failed, which is also the experience of other laboratory workers. Here is presumably a fatal case of multiple acute arthritis caused by a coccus corresponding to Poynton and Payne's organism. Whether it is the cause of acute articular rheumatism or rheumatic fever cannot be stated. The most interesting feature in the case is the absence of a primary focus of infection,—such as a pneumonia, or a naso-pharyngeal condition. The question of its virulence for rabbits is of no etiological importance in this connection. Virulent cultures of pneumococci or streptococci from cases of fatal pneumonia or streptococcic endometritis, etc., may be completely virulent for the ordinary laboratory animals. At present in the laboratory of the Montreal General Hospital we have cultures of streptococcus pyogenes and pneumococcus from fatal cases of pneumonia that are not virulent for rabbits, guinea-pigs and mice. The virulence of these, however, can by repeated animal passage be raised. The organism described by Poynton and Payne is, in my opinion, a strain of the pneumococcus or streptococcus pyogenes.

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ULCERATION OF THE CORNEA.

SOME POINTS ON ETIOLOGY AND TREATMENT.

BY

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(From the Pathological laboratory of the Montreal General Hospital.)

It will be readily understood that in a paper limited to fifteen minutes it is not proposed to deal fully either with the etiology or treatment of ulcerative processes of the cornea, but rather to touch upon one or two points which seem to mark an advance in our knowledge of this subject. That disease of the cornea makes an important chapter in ophthalmology you will all agree, that ulceration of the cornea forms the most important part of that chapter will not be denied. One quarter to one third of all ophthalmic disturbances consist of corneal disease. Uhthoff, in ten thousand blind people, found thirteen per cent. due to corneal disease. Of the suppurative forms of keratitis ulceration of the cornea is the most common. The frequency of this affection, the serious damage to sight which it often causes demands from us most intelligent treatment.

Under etiology there are many points apart from the direct cause which need to be considered. The cornea is not supplied with blood vessels, so that the central part, so often the starting point, is less able to combat disease than is the periphery. Then, too, the cornea is the most exposed part of the eye to external injury. At its margin the cornea meets conjunctiva, sclera, and uveal tract. It is therefore divided into three parts: a conjunctival, a scleral and a uveal. From Fuchs quoting Waldeyer we learn the conjunctival portion consists of the anterior epithelium, Bowman's membrane and some of the anterior lamellæ of the corneal stroma. The scleral portion consists of the

Read at the section of Ophthalmology and Oto-Laryngology of the Canadian Medical Association, June, 1908.

middle layers of the lamellæ, while the uveal portion equals the posterior lamellæ, Descemet's membrane and the endothelium. Bearing this division in mind helps considerably in understanding the route of pathological processes. The conjunctival portion of the cornea suffers most from pathological conditions of the conjunctiva. We know the majority of cases of conjunctivitis are caused by pathogenic micro-organisms. We know also that corneal regenerative processes are about as rapid as the conjunctival, but when pathogenic bacteria complicate the repair, conditions are different. Ordinarily the cornea has a sufficient amount of lymph for its nutrition, but with the entrance of pathogenic micro-organisms upon the scene, the cornea is vastly inferior in regenerative ability. It is now a struggle between micro-organisms and the cells which have so often a considerable distance to go. This is why ulceration in the centre of the cornea develops and spreads so easily.

Ulcers begin as a rule in the conjunctival part of the cornea, quickly invade healthy tissue and entail a loss of substance. When repair begins, the cells of the tissue conquer the pathogenic processes by opposing to them a barrier of cells—a zone of infiltration. This produces an arrest of the ulcerative process. The loss of substance must now be replaced. The histology of ulcers of the cornea has been thoroughly studied. Loss of epithelium is replaced by growth of epithelium from the edges of the ulcer, that is, healing with a perfect restoration to the normal state without leaving a permanent opacity. Loss of corneal stroma is filled by ciccatricial tissue from the bottom and sides of the ulcer and is different from the normal tissue of the cornea. It is opaque.

Inflammations of the cornea may be divided into two groups, primary and secondary. This division is especially applicable to ulcers. By secondary, we mean ulcers the result of inflammation in the conjunctiva and in this group belong the vast majority of cases. The normal conjunctival sac is at times the seat of pathogenic bacteria and many cases of conjunctivitis from micro-organisms may be so mild as to cause the patient no inconvenience. When in these cases the epithelium is abraided, or when in cases of pronounced conjunctivitis or dacryocystitis the cornea is accidentally scratched the entrance of bacteria into the corneal tissue is allowed. When this happens the conjunctival micro-organisms play a most important rôle, to such an extent in fact, that our results, good or bad, depend upon our ability in combating this cause. Too frequently, while doing our best, we see useful vision destroyed, and this so often in patients who can ill afford the wage earning ability of one eye.

Now, what is the most common cause of ulceration of the corneaé For a comparison I have taken 41 consecutive cases from hospital and private practice, where in each case an attempt has been made to find a definite etiological factor. Of these 41 cases

21 were due to the Morax-Axenfeld diplo-bacillus.
2 were due to the Gonococcus.
8 were due to the Pneumococcus.
2 were due to the Streptococcus Pyogenes.
3 were due to the Staphylococcus Pyogenes Aureus.
2 were due to the Staphylococcus Pyogenes Albus.
2 were not due to bacterial infection.

We have in this list 22 cases caused by the diplo-bacillus, that is, in more than half of the cases, if seen early, there is no reason why the ulcerative process should extend beyond the corneal epithelium, so that in over 50 per cent. of the cases, healing should take place without scar tissue and with normal vision.

In the Montreal district, the commonest form of conjunctivitis is the Morax-Axenfeld or diplo-bacillary, a form so varying in its clinical appearance and severity that a diagnosis must depend upon the bacteriological examination. How common it is may be better judged from the fact that in less than three years I have seen over 400 cases here. A number of the cases here reported, followed the removal of a foreign body. Generally the ulceration complicating diplo-bacillary conjunctivitis is of the catarrhal type. It was formerly thought a superficial ulceration at the periphery of the cornea was characteristic of this form of infection, but now it is known the diplo-bacillus can give rise to ulceration as severe in type as the ulcus serpens of pneumococcus infection.

Case 2 was a man of 50 years, a teamster, who gave no history of trauma or tear sac trouble. The cornea, over its central third showed deep ulceration, with a large hypopion, the iris was dull, there was severe chemosis, vision was equal to the percepion of light, and the tension was normal. The treatment consisted of warm fomentations, and the instillation of sulphate of zinc ¼ per cent. solution. Scopolamine was used as a mydriatic. He left the hospital with a useful eye, the vision equal to two thirds of normal, a much better result than would have been obtained had the infection been taken for a pneumococcus one and the ulcer cauterised; for it is to be remembered that while the cautery destroys the pathogenic micro-organisms, it also destroys cell tissue, so

that any case of ulceration of the cornea which can be cured without cauterization, should be.

Infection of the cornea from the pneumococcus generally takes the form of ulcus serpens, which we all know well. Streptococcus ulceration is fortunately rare, while Staphylococcus, though occurring fairly often, is of a mild type. Now, will closer attention to etiology help us to bring about better results, that is, will this definite knowledge as to the etiological factor causing an ulceration help us to limit the destruction of corneal tissue to the epithelium, thus preventing the destruction of corneal stroma?

Where we have ulceration of the cornea from the diplo-bacillus, whether that be the catarrhal form or ulcus serpens with hypopyon, the indication is treatment with a weak solution of the sulphate of zinc. This is the treatment par excellence, as the sulphate of zinc is regarded by many as a specific in this form of infection. I always like to give the conjunctival sac and cornea a good flushing with a ¼ per cent. solution and then have instilled through the day frequently drops of a ½ per cent. solution. Treatment of this kind disposes of over 50 per cent. of our cases. The rest may be placed in one group, for their clinical course and treatment are very similar. Ulceration caused by the pneumococcus forms the largest part of this list. In this form, so often preceded by dacryocystitis, prevention should form a prominent part of our treatment. Buller, in a severe case that I remember, obtained a good result by tying ligatures just inside the puncta and in this way prevented the pus from the inflammed lacrymal sac from adding fuel to the fire. I recall a lost eye which resulted from the removal of a foreign body from the cornea, where pneumococci were present in the conjunctival sac. This possibility deserves some attention, especially as it is well recognized now that eyes that have undergone a severe ulceration of the cornea, may prove dangerous ones. Radical treatment in dacryocystitis would be the means of reducing greatly the number of cases of pneumococcus ulceration of the cornea. The general practitioner should be taught that his duty by no means ends with the removal of the foreign body. Much was expected from Römer's serum, but the results elsewhere have never equalled those obtained by Römer. Whether the inoculation of a vaccine in such cases would do good I hope in the near future to try.

Systemic treatment in severe ulcerative conditions must be ever borne in mind. The patient should be put in the best possible condition, the better to enable the cornea to fight the infection. The actual cautery, carbolic acid, iodine, nitric acid, acetic acid, all have their adherents.

They are all used for the same purpose, to destroy the destructive organisms and preserve as much of the cornea as possible.

Whatever our treatment may be, an exact knowledge of the etiological factor helps us to anticipate the severity of the process, for a beginning pneumococcus ulcer may be clinically identical with a diplo-bacillary one. But where we know which of these micro-organisms we are dealing with, we know exactly what our treatment must be. The clinical diagnosis is incomplete without a bacteriological one. The widening of bacteriological methods in ophthalmology is in no better way shown than by a study of the etiology of corneal ulceration, not because it is perhaps scientific, but because of its practical value. It is essential especially among adult patients to treat from the beginning not only energetically, but scientifically, ulceration of the cornea. The speed with which ulcers of the serpiginous type develop is only too well known, whether the organism present be the pneumococcus or diplo-bacillus. But of inestimable value as regards treatment and prognosis is it to find out at the beginning what etiological factor we have to deal with. Nor must it be supposed that bacteriology will always tell us the cause, but these methods by giving us positive or negative results, direct us to treat accordingly. These ulcers may present identically the same clinical picture, but in the light of our present knowledge, if we wish to treat and prognose with that degree of certainty with which we should, how important it is to find out what etiological factor we have to deal with. The advantage of knowing whether we are dealing with an ulceration caused by micro-organisms or not is easily understood. The value of knowing whether the micro-organism is the pneumococcus or diplo-bacillus will not be questioned. In pneumococcus ulceration we have an exceedingly virulent process to combat. In diplo-bacillary infection we have a pathological condition easily controlled and cured.

PYELONEPHRITIS AS A COMPLICATION OF PREGNANCY AND THE PUERPERAL PERIOD.

BY

DAVID J. EVANS, M.D.

Pyelonephritis was first described as a complication of pregnancy by Reblued in 1892, but it was not until 1899 that much attention was paid to the subject. Since then, quite a literature has developed.

This complication is associated with the early part of the latter half of pregnancy being most common from the fifth to the seventh month. It is said to occur most frequently in primiparæ and is most commonly localized on the right side, though either or both kidneys may be affected.

The onset is often insidious and may escape observation unless constitutional symptoms develop. The first symptom that may be noticed is a vesical irritation which may last from a few hours to several days, when the patient is suddenly seized with more or less paraxysmal pain, most commonly located in the right lumbar region. Rigors, high fever, and vomiting may now be present. At first the urine may be quite clear, but after a certain time will be found to contain large quantities of pus. The presence of pus in the urine may be intermittent. Constipation or diarrhœa may be present. The pain may be complained of as being most acute in the upper portion of the abdomen to the right side, or in the right lumbar region behind, whence it radiates downwards into the groin or thigh. If untreated or unrecognized rapid loss of flesh occurs, the patient becomes cachetic. General septic infection follows and death finally closes the scene.

It is probable that the disease is more common than is generally recognized, as the lighter cases escape observation.

Transient albuminuria associated with heavy deposit in the urine is probably due to the occurrence of mild attacks of pyelonephritis. The condition has been ascribed to the compression of the ureter on the brim of the pelvis resulting in its dilatation. The pressure of the uterus, which by the fifth month has enlarged sufficiently to project well above the brim, is the probable cause. Tortion of the uterus, which is extremely common, favours traction upon the ureters, thus causing their lumen to be flattened. The right ureter is the one most commonly affected. The dilitation consequent upon this pressure results in damage to the mucosa of the ureter, thus favouring the development of localized infection. It is probable that at first hydronephrosis is present, subsequently, after infection developing into pyelonephritis.

The infectious process may be due to an extension upwards from the bladder or it may be derived from the blood.

In pregnancy the infecting organism is usually the colon bacillus, and is probably derived from the intestine, as it is frequently noticed that gastro intestinal disturbances of an indefinite character precedes the onset of the condition.

Streptococci, staphlococci, gonococci and the bacillus enteritis have been found present in a few cases.

The urinary contents vary considerably. Pus, blood, epithelium, and granular debris are usually present. Albumin is noted in varying amounts. The reaction is usually acid, though in neglected cases, where cystitis is present, it may be alkaline.

The facts, first, that pus may not appear in the urine for several days

after the onset of the symptoms, and secondly, that pus may occur intermittently in the urine from the pressure on the ureter being variable, should be borne in mind.

The diagnosis may be difficult, especially when the general symptoms mask the local signs, particularly when the condition arises acutely in the early puerperal period with rigor, high fever, vomitting and pain in the right groin. Usually in such cases infection of the genital canal is suspected.

During pregnancy the condition is frequently mistaken for appendicitis, occasionally for typhoid fever or salpingitis.

Generally pain over lumbar region, usually the right, palpation of a large and tender kidney, associated with the presence of pus and blood in the urine, particularly if the latter is acid in reaction, enable a diagnosis to be made. Usually per vagina in these cases the sensitive ureter can be palpated.

If a pregnant woman presents pus in the urine with no increase of frequency of micturation and little or no pain in the region of the bladder, pyelonephritis may be suspected. Paroxysmal pain occurring in the right side of the abdomen, associated with intestinal disturbances and slight febrile reaction occurring in a pregnant woman between the fourth and seventh month, should cause one to make a careful examination of the urine. The condition may be diagnosed from cystitis without much difficulty. In cystitis there is usually pain or tenderness on pressure over the bladder. Use of the catheter causes distress, and the distension of the bladder actual pain. In pyelonephritis, catheterization, distension of the bladder, etc., give rise to no distress. In doubtful cases, cystoscopy or catheterization of both ureters will make diagnosis certain.

The treatment of the milder cases consists of rest in bed, milk diet, the copious use of water and simple purgation. The drugs most commonly employed are urotropin and methylin blue. Where this treatment fails to rapidly produce an amelioration of the condition, nephrotomy or the induction of premature labor may be necessary. Jeannin recommends that in all cases of pyelonephritis the urinary bladder should be slowly distended with a saturated solution of boric acid three or four times in the 24 hours. Usually the induction of premature labor is the treatment selected, as in most of the cases emptying of the uterus is followed by rapid improvement.

Stoeckel divides cases of pregnancypyelitis into three groups: (1) Mild cases—obstruction in the ureter without infection of the urine. Hydrureter. (2) Moderately severe cases—well marked obstruction of

the ureter with infection of the urine with Coli. (Bacteruria, Pyuria, Pyureter, Pyelitis.) (3) Very severe cases—protracted cases with abcesses of the kidney from mixed infection. (Pure Pyonephroses.)

If the pain and fever persist in spite of treatment by rest in bed, fluids and urotropin, direct local treatment should be resorted to. This includes: first, induction of abortion; second, catheterization of the ureter with or without injection of the kidney pelvis; and third, nephrotomy and the formation of a renal fistula.

He considers the interruption of pregnancy seldom if ever permissible. Catheterization of the ureters in his opinion is less unpleasant and less dangerous than is a vaginal examination if a pregnant woman. He employs a 3 per cent. boracic acid solution to douche out the ureter and pelvis of the kidney. In one case he employed 1 per cent. collargol solution for this purpose with satisfaction.

I have seen three cases of mild pyelonephritis in the course of pregnancy in my private practice all yielding promptly to simple treatment.

The following reports of three cases are from the records of the Montreal Maternity. The first two occurred during my service last summer and the third during that of Dr. Cameron, to whom my thanks are due for his permission to make use of it.

Case I. D. S. Age 28. Married. Third pregnancy. Last period, March 21, 1908. Admitted July 20, 1908, in 24th week of pregnancy, complaining of chills and fever, pain in right side of abdomen.

On admission, temperature 103°, pulse 128. On July 13th patient began to suffer from frequent and painful micturition lasting three days. Two days later she had a chill followed by fever. This was repeated on the following days, when she also noticed pain in upper right abdomen.

On admission the urine was found loaded with pus cells, trace of albuminuria, no casts, alkaline.

Patient looked very ill. Severe pain was complained of on light pressure over the upper abdomen on the right side. Pressure just below the costal margin in the right lumbar region gave rise to sharp pain. The kidney could not be palpated. Nothing else abnormal was noted beyond a foul vaginal discharge.

Treatment. Rest in bed with milk diet, urotropin, unlimited fluids. The temperature ranged between 102° and 103° F. for five days, then gradually returned to normal. The tenderness disappeared within a few days and the urine rapidly cleared up, there being a most marked diminution of pus within four days of admission. The first specimen examined was alkaline, but all the others strongly acid.

The patient remained in hospital twenty-three days, when she was discharged. She returned later for confinement, which was uneventful.

Case II. K. F. Age 22. Was delivered by difficult high forceps operation on account of contracted pelvis Aug. 7th, 1908. Was discharged Aug. 28th in good condition. On Sept. 3rd she suffered from pains in right lower quadrant of the abdomen, was feverish and constipated. This pain returned at intervals, and on Sept. 7th the patient was visited at home. In bed. Temperature 102°, pulse 120. Slight tenderness in right lower quadrant, no rigidity. Next day she was seen and examined by Dr. Little at the M. G. H. Gynecological Clinic. Pelvis negative. Four days later she was readmitted to the Maternity complaining of pain on the right side of the abdomen. T. 98°, P. 65. Lungs clear. Spleen not enlarged nor palpable. Widal negative. Urine acid, trace of albumen, large quantity of pus cells, no casts.

Diagnosis. Pyelonephritis, right kidney.

Treatment. Rest in bed. Fluids. Urotropin, bladder lavage for a few days, and hot formalin douches on account of a very foul vaginal discharge.

For four days the temperature ranged between 100° and 103° F., but she had no chills. The pain and tenderness over the right kidney was very marked at first, but disappeared by the sixth day.

Case III. Fatal case. Sixth month of pregnancy. Admitted with temperature 103° F. and foul vaginal discharge. Complained of pain in chest and abdomen. Next day the pain was most severe in right abdomen and back. She rapidly developed evidence of profound sepsis. Abortion occurred seven days after admission and she died two days later.

Autopsy showed signs of general septicæmia, acute gonorrhœa and double pyelitis.

TUMOUR OF THE TEMPORO-SPHENOIDAL LOBE AND "DREAMY STATES,"

BY

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Mr. President and Gentlemen:

Some of you will remember a patient whom I presented before this Society in the early part of last session with the above diagnosis and will perhaps be interested in following the case to a conclusion. The definite localizing value of these so-called dreamy states, their nature,

often rendering the patient diffident about mentioning them, and the physician skeptical about believing them, or at least appreciating them to their full value make the case worthy to be recorded.

Often the first sign of a grave cerebral condition these dreamy states should be of as much interest to the general practitioner as the fine apical crepitations in incipient pulmonary tuberculosis.

C. B., female, aged 17, French Canadian, recommended to the Neurological Clinic by the Outdoor Department for Diseases of the Eye at the Royal Victoria Hospital in February, 1906, complaining of loss of sight and "attacks."

The present illness commenced about three years previously with attacks of "vertige." The first attack came on when she was dressing herself one morning in her own room. It commenced with a feeling of dread, she trembled as if from cold and felt as if she were dying. She says she did not lose consciousness, but during the attack, she saw as if in a dream a woman apparently trying to save a child from drowning. She could not see the woman's face. The patient, who was a very intelligent young woman, waxed quite eloquent in her description (of which the foregoing is as literal a translation as possible), which was given quite spontaneously on the patient's part without any leading questions being asked. After this she averaged about one attack a week, all of the same nature, ushered in by this feeling of intense fear and consisting of the same vision. She could recognize the woman as the same one, although she never saw her face. There was no aura of smell or taste such as is frequently experienced in these cases. The face is said to have become very pale and the lips cyanosed. The attacks lasted four or five minutes. There were no convulsive movements, no involuntary micturition nor biting of the tongue, and she says no loss of consciousness. Usually she slept after the attack for a short time. Only occasionally did she have headache, which was always on the left side of the head and face, and on one or two occasions only was accompanied by vomiting. About a year previous to her coming under observation her eyesight began to get poor, and in the course of two weeks she became blind. She never complained of diplopia.

Lately, and only since she became blind, the patient said the attacks changed somewhat in character, and she saw no definite vision, but during the fit, events passed before her mind and then afterwards she would not know if these events had actually happened or if they had been dreams. In every other way the attacks were similar to those already described. The headache became more frequent and severe, but was always confined to the left side of the head and face and associated

with a numb feeling in these parts. She complained, too, that she could not taste as acutely on the left side of her tongue as on the right.

Previous History: Always healthy; no history of injury.

Family History: Marked family history of tuberculosis and one sister died of some cerebral trouble.

On Examination she was found to be very intelligent, of cheerful disposition, with absolutely no sign of dysarthria or aphasia of any kind. She had always been right handed. She could not recognize peppermint or cloves in either nostril. There was well marked post neuritic atrophy with complete blindness. The right pupil was larger than the left, neither reacted to light; both reacted on convergence. The other cranial nerves were normal. The muscular and sensory systems showed nothing abnormal. The reflexes were all normal.

She continued to come to the clinic every week and was examined carefully each time. On March 28th, *i.e.*, about a month later, she was found to have loss of sensibility to pain and touch over the skin supplied by the left fifth nerve with loss of conjunctival and corneal reflexes. There was no paralysis of the motor branches of the nerve. Taste was lost on the anterior two-thirds of the left side of the tongue and she had a partial nerve deafness on the left side. The abdominal and epigastric reflexes were diminished on the right side. Plantar reflexes were normal, showing flexion right and left.

In December, 1907, the attacks again became somewhat different and again she saw images, this time of people's faces, but indefinitely, so that she could not recognize the face again; at the same time there was convulsive movements of the head to the right. She did not lose consciousness during the attack, but could speak and understand everything said to her. She continued to have similar attacks until May, 1908, when she began to suffer from severe pain in the left side of her face, which continued, and early in July a physician was induced to try and give relief by pulling out a tooth; but it broke off, leaving the roots in place. She then had a slight deviation of the lower jaw to the left on opening the mouth, and evident weakness of the left masseter and temporal muscles, showing motor fifth paralysis. She was emaciated, weak and nervous. Dr. Stuart Nichol at my request then examined the teeth, and extracted the root; but this giving no relief, operation was advised.

She was admitted to the Royal Victoria Hospital and trephined immediately over the tumour in the temporo-sphenoidal lobe on the left side. Unfortunately this did not give the desired relief, and the patient died in the course of a few weeks. In the last days, it could not be

definitely determined when, on account of the dressings, the tumour mass showed itself posteriorly in the roof of the mouth on the left side.

On post mortem examination the tumour was of the nature of an endothelioma, more or less circumscribed in the brain, involving the second and third temporal convolutions in their anterior two-thirds and the uncinate and the hypocampal gyri. The anterior one-third of the first temporal convolution is also partially involved. Inferiorly it was found to have invaded the dura and bone, involving the Gasserian ganlion and spreading into the Antrum of Highmore.

It will be noticed that there was no aphasia of any kind and no disturbance in the faculty of naming objects at any time, although the second temporal convolution is destroyed, showing that in this patient, at least, there was no separate naming centre in the second temporal convolution such as Mills, of Philadelphia, describes. The fact that there was no aura of smell preceding the attacks is probably explained on the grounds that here we have a destructive lesion of the uncinate gyrus.

It was interesting to find the constant diminution of the abdominal and epigastric reflexes on the right side, as evidence of impairment of function of the pyramidal tract by pressure. This is an important aid in diagnosis, often, as in this case, being present before destruction of the pyramidal tract has become sufficient to give rise to a Babinski reflex. This shows very beautifully the *cerebro spinal* nature of these superficial reflexes: the reflex arc being made up of the sensory nerve fibres and sensory paths in the cord, with their cells probably in the basal ganglia; the efferent part of the arc being served by the pyramidal tract and the motor nerves pressure on the pyramidal tract then has impaired the functioning of the arc. Similar cases in the literature are rare, as far as I have been able to find in a hasty search. Dr. James Anderson, in 1886 (Brain, Vol., ix.), reported a similar case with autopsy, in which the attacks started with a rough, bitter sensation in the mouth, and then the patient saw some trivial scene of his childhood's days, which always recurred. He had convulsive movements of the right side of his face and of the right arm. The tumour was found to involve the left temporo-sphenoidal lobe. A second case was reported by Hughlings Jackson and Beevor (Brain, Vol. xii.) of a woman aged 53, who had attacks, ushered in by a smell of dirty burning stuff, and then she saw a little black woman who was rather agreeable and was always flitting about the kitchen. She had also the general signs of increased intracranial pressure. The tumour was discovered at autopsy in the right temporo-sphenoidal lobe.

Buzzard has reported a third case (Lancet, June 30th, 1906), which I had the advantage of observing, and which was quite similar to the above described. The tumour was in the right temporo-sphenoidal lobe.

In conclusion, I should like to emphasize the fact that one must avoid putting leading questions. One such question may destroy altogether the value of subsequent examination. The term intellectual aura sometimes used for such a condition is quite incorrect. These "dreamy states" are in no wise a warning, but are as much the expression of the fit itself as the convulsive movements which sometimes follow, and as much a focal epilepsy as the ordinary Jacksonian type.

PARALYSIS OF THE LEFT RECURRENT LARYNGEAL NERVE IN MITRAL-VALVE DISEASE.

BY

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There are two conditions in which valvular disease of the heart suggests the existence of aneurism of the aorta. In insufficiency of the aortic valves, as Corrigan pointed out in his original paper, the throbbing of the aorta near the heart may lead to this diagnosis. This is particularly the case in young persons in whom the degree of dynamic dilatation may be extraordinary and even compel the diagnosis of aneurism.[1] In mitral valve disease with great dilatation of the left auricle and compression of the recurrent laryngeal nerve there may be a combination of symptoms and physical signs most suggestive of aneurism. Paroxysms of orthopnœa, cyanosis, the cracked voice, the paralyzed vocal cord, and on inspection a pulsation in the 2nd left interspace may make a most deceptive combination. My attention was first called to the condition by a case in which the late Professor Nothnagel of Vienna, had suggested the diagnosis of aneurism, though the patient was known to have an old mitral lesion. She was a large, stout woman, and the severe paroxysms of dyspnœa and the great cyanosis, without dropsy or other signs of venous stasis were certainly very suggestive of aneurism. In the second case I saw there was no suspicion of aneurism, but in the third case the diagnosis was suggested by the combination of the laryngeal paralysis and the unusually wide-spread pulsation in the 2nd left interspace. The condition is not common. I have only met with three cases, and it is not a symptom likely to be overlooked, as one's attention is at once called to it by the change in the voice.

Ortner, of Vienna, seems to have been the first to call attention to it in 1897. A boy of 14 with mitral lesion had inequality of the carotid pulse, a complete paralysis of the left vocal cord. The diagnosis of aneurism was made, but the post mortem showed only the mitral disease with compression of the left recurrent nerve between the aorta and the greatly dilated auricle. Since Ortner's paper many cases have been reported, chiefly in Vienna and in Italy, and in America by Herrick, of Chicago. The post mortems have shown the nerve to be compressed between a greatly dilated auricle and the aorta; in a few cases the compression seems to have been due to the dilated pulmonary veins, and in the case of Fischauer, of Vienna, by the left pulmonary artery. In a few instances both nerves have been paralyzed, and in explanation it has been suggested that the enlarged heart drags down the aorta and the right subclavian artery sufficiently to cause atrophy of the nerves as they pass beneath these vessels. In *Case III,* here reported, the small section of nerve between the wall of the auricle and the aorta was distinctly more opaque white in colour than in any other part of its course. Occasionally the paralysis of the larynx may be a coincidence in an old mitral lesion as in a case referred to by Reitter, in which the paralysis was diphtheritic in origin. In *Case II,* the patient had had diphtheria and it was thought at first that the paralysis might be due to this cause, but the change in the voice antidated the attack of diphtheria by at least six months.

Case I.—I saw, June 10th, 1888, Mrs. G., aged 45, a stout, large woman, complaining of dyspnœa on exertion and paroxysms of coughing, and shortness of breath at night. She had been very healthy, had had six children, had never had rheumatism, and until about a year ago she had had no trouble with the breathing. Many years before she had been told she had heart disease and she has been short of breath on exertion for ten or more years. About six months ago she noticed that her voice had changed. In April of the present year she was in Vienna and consulted Prof. Nothnagel, who wrote to her husband that in addition to the old mitral disease it was quite possible that she had an aneurism of the aorta as the left recurrent laryngeal nerve was paralyzed and the paroxysms of nocturnal dyspnœa suggested pressure.

The patient was a large-framed woman who weighed 195 pounds. The face and hands were slightly cyanosed and she was very short of breath on exertion. The apex beat was neither visible nor palpable. A feeble thrill could be felt under the left breast. There was no pulsation to be seen or felt to the left of the sternum. There was no tracheal tugging. It was impossible to make out definitely the area of heart flatness, but

it appeared to be increased. There was a well marked presystolic murmur in the apex region with a soft systolic murmur, heard as far out as the mid-axilla. Nothing could be heard behind and the air entered both lungs equally.

Her voice was cracked, and on examination with the laryngoscope, there was seen to be paralysis of the left vocal cord. The pulse was small, and irregular. With diet, a careful regulation of her life and the use of digitalis she improved very much. I saw her once again in May, 1889, when she had slight swelling of the feet, great irregularity of the heart, and extreme dyspnœa. The paralysis of the left vocal cord continued. She again improved and was able in the summer to go to Europe. In September, she died in an attack of urgent dyspnœa. A post mortem examination was made. No aneurism was found. The mitral orifice was stenosed and the left auricle was enormously enlarged. I only had the verbal statement of the husband as to the condition of the heart. There had been so many opinions given, particularly as to the possibility of aneurism that it was to determine this point more particularly that he consented to an autopsy.

Case II.—B. M. S., aged 27; came to me first in March, 1892, complaining of shortness of breath, palpitation of the heart, cough, and change in character of her voice.

She had always been pretty healthy and well; though never very robust. Family history good. She has never had rheumatism, St. Vitus' dance, or typhoid fever. She had scarlet fever about the age of 12, subsequent to this had whooping-cough, which persisted and evidently from her description and her father's, the attack must have been unusually severe. In October, 1891, she had diphtheria, light attack; was not in bed at all. She has not regained her strength from this time.

In January, she had an attack of fever of some sort, cause not known, with great shortness of breath. Change in the voice has been noticed more or less for a year. When she first came under observation she was pale, short of breath, and on examination there were all the characters of well-marked mitral stenosis. She was ordered Blaud's pills and was sent to Dr. Warfield for local treatment of the throat. She improved very much through the summer, but is still short of breath on exertion, and has palpitation of the heart, but her general condition is evidently very much improved.

Present condition. Looks better; cough not husky; voice distinctly changed, a little husky and broken; finds it impossible to raise it. Dr. Warfield has examined the throat again and found the left vocal cord scarcely moved at all. Pulse 84, volume small but regular; tension not

increased. The apex beat is about normal in position; the impulse is forcible, and on palpation there is a definite thrill followed by a well marked systolic shock of considerable intensity. Cardiac dulness begins on third rib. On auscultation well marked, rough, blubbering presystolic murmur followed by a loud snapping first sound. There is also a systolic murmur, short but intense. The pulmonic second sound is accentuated; the aortic second is normal. No other features of note.

April 19th, 1893. Patient examined again to-day. She has had much more shortness of breath and has had swelling of the feet. She is paler, and has very little appetite. The voice is still husky, and Dr. Warfield reports that there is still paralysis of the left vocal cord. The heart condition has changed very materially. The apex beat is more diffuse, and the systolic murmur has increased very much in intensity. There is a loud, blowing, systolic murmur propagated into the axilla. The presystolic murmur is well heard, but the thrill is not so marked.

In the autumn of 1893, anasarca came on, and she gradually sank and died November 9th, 1893,

Case III.—At my clinique, February 25th, 1908, I showed a patient of Dr. Mallams, A. R., æt. 46, who was suspected to have an aneurism. The patient was dropsical, with œdema of bases of both lungs, shortness of breath, and all the features of a severe cardiac breakdown.

The examination of the chest gave the following: Large area of visible impulse in 3rd, 4th, 5th and 6th left interspaces. In 2nd left interspace also, as far out as 5 c.m. from the sternal border there is a distinct pulsation. On palpation the impulse was felt to be diffuse and the heart's action irregular. On auscultation, double murmurs at mitral and at aortic areas. There was paralysis of the left vocal cord and the voice was cracked. The patient has been a healthy man with the exception of three attacks of acute rheumatism, at ages of 14, 26 and 40. Seven months ago he had shortness of breath and dropsy, but gradually recovered. The present attack began about a month ago, and he has been growing worse. For weeks the patient was very ill, but he gradually improved, and the dropsy disappeared and by the middle of April he was sitting up. The heart's action was regular, there was a large area of impulse, and the visible impulse in the 2nd left interspace was very marked. It seemed directly continuous with that in the 3rd interspace, and was better seen than felt. It was this large area of visible impulse in the 2nd left interspace with the paralysis of the left vocal cord that suggested the possibility of aneurism. The fluorscope showed very clearly that the left auricle was enormously enlarged and that there was no aneurism of the aorta. The patient left the hospital June 26th. He was

readmitted August 18th, in a state of asystole and died on the 24th. *Autopsy* by Dr. A. G. Gibson. The area of heart uncovered by lung begins at the 2nd left chondro-sternal junction and passes outwards and downwards to the junction of 4th rib with its cartilage and then transversely outwards. On opening the pericardium, the tip of the right auricle extends to the left border of the sternum. The rest of the anterior surface of the heart in relation to the chest wall is formed by the right ventricle. The aortic valves are not competent. The mitral orifice admitted two fingers, the tricuspid three. All the chambers are greatly dilated and the heart as a whole is much hypertrophied. The left auricle is enormous, admitting a small fist. The aortic segments are sclerotic and the anterior leaflets joined together. The mitral valves are much thickened, the orifice somewhat narrowed and the chordæ tendineæ thickened. The coronary arteries were normal. The left recurrent laryngeal nerve was traced and just at the point where it lies between the aorta and the left auricle it looked sclerotic and of a duller white colour than elsewhere in its course.

PULMONARY GANGRENE AND ABSCESS.

BY

GEORGE E. ARMSTRONG, M.D.

Pulmonary Gangrene and Abscess although recognized by Hippocrates, and considered by various writers from that time up to the present, has become of practical interest to the surgeon chiefly since the era of Listerism. Indeed, it is only within the last few years that the surgery of the lungs, including pulmonary gangrene and abscess, has received serious attention, and been placed upon a sound scientific basis. The various details connected with the diagnosis, operative treatment and prognosis of these conditions have been advanced very largely by the labours of Quincke, Tuffier, Gluck, Karewski, Garré, and Körte.

The present paper is based upon 14 cases of pulmonary abscess and gangrene. The ages were from 20 to 53. There were ten males and four females. The right side was diseased in six, and the left side in eight cases. The upper lobe was involved in three cases; the middle in one, and the lower lobe in eleven.

Three of these patients were epileptics and three were alcoholics. In six cases the disease seemed clearly to be secondary to pneumonia, and probably in all of the six it was an aspiration pneumonia.

In two the pneumonia immediately followed the extraction of teeth

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under general anæsthesia, alveolar abscess being present in both instances. In one it began by sudden severe pain in the right side two days after confinement. The following day the patient spat up a mouthful of blood-stained material. A pneumonia then developed which would seem to be embolic in origin.

In one instance the abscess followed trauma. An Italian fell 40 feet, striking on his back. A traumatic pneumonia developed, followed by abscess.

In no instance was a foreign body found or suspected. Foreign bodies in the bronchi as a cause of gangrene are very rare. Weist in a collection of 1,000 cases of foreign bodies in the air passages does not mention gangrene as a sequel. Hoffman in 252 cases reported in Nothnagel's System, mentions it only twice, while Murphy in his article on "Surgery of the Lung," in a collection of 59 cases of abscess does not give foreign bodies as an etiological factor. Clarke and Marine after a careful search of the literature found but 31 cases in which gangrene followed the inspiration of a foreign body. In these 31 cases, the foreign body was a tooth twice, a pin once, a piece of wood once, a button twice, a head of grain or grass seven times, a bit of evergreen twice, a fruit-stone twice, a bone ten times; not mentioned four times. The gangrenous process in these cases lasted from three days to four years, most frequently from two to four weeks. The right lung was involved in 14 cases, the left in seven cases. Death occurred in 21 cases, recovery after thoracotomy in two, and spontaneous recovery in four cases. The foreign body was coughed up in five, four of which subsequently died, and one made a rapid recovery.

The diagnosis and location of pulmonary abscess is sometimes extremely difficult, and differentiation between abscess and gangrene is, in many instances, quite impossible. Lenhartz and Körte think the differentiation artificial and uncertain. In both lesions the primary condition is infiltration and smelting together of the tissues, and whether these tissues break down and form large sequestra, or break down into small particles, often as elastic tissue, is only a question of degree. In fact it is difficult and sometimes impossible to tell whether there is a sequestrum or not. The differentiation by examination of the sputum may lead to erroneous conclusions, for although a pure purulent expectoration would stand for abscess, and a fetid ichorous expectoration for gangrene, yet a sequestrum may be present with a purely purulent expectoration. In one of Körte's cases 10 days after the opening of the abscess cavity in the lung a sequestrum the size of the end of the thumb was removed. In fact, a condition of abscess and

gangrene may both obtain in the same cavity. The prognosis would seem to be better in cases of pure odourless pus.

Foul-smelling purulent sputum containing lung tissue or elastic tissue indicates the presence of pulmonary abscess, or gangrene or both Traces of blood are frequent and hæmorrhages are not uncommon. If a putrid sputum follows acute lung disease, three things are possible: abscess or gangrene, bronchiectic cavities, or a bursting of pus into the lung from the pleura, subphrenic region, or the mediastinum. In the differentiation of these three conditions, a careful study must be made of the history of the cases, as well as a careful physical examination.

A thin layer of normal lung tissue over the cavity will completely mask the condition. Fluorescopic and x-ray examinations are most valuable aids in these cases, and will often show the location of the cavity when physical signs and other methods of examination fail. They may also show how deep or how far removed from the surface of the lung is the abscess. For instance, the physical signs may indicate that the abscess is at a certain level, but a fluorescopic examination may show clearly that the cavity extends downwards and that its lower end is farther removed from the surface of the lung than the upper end. This knowledge may prove most valuable to the surgeon, showing him where to place his incision, to secure the best drainage of the cavity subsequently.

The diagnosis of bronchiectatic lesions by the fluorescope is much more uncertain. As remarked by Pfeiffer (Zur Diagnose der Bronchiektasen in Rontgenbilde. Beitrage Zur. Klin. Chir. Band 50—1906, pg. 279), the similarity of the symptoms of bronchiectasis when accompanied by fœtid bronchitis to those of lung gangrene and abscess is very close and the difficulty in differentiating between the two is extremely great. In bronchiectasis the condition, of course, is generally more wide-spread and diffused over one or more lobes in one or both lungs.

The use of the exploring needle as a diagnostic measure is inadvisable, because of the danger that the two layers of the pleura are not adherent. The pleural cavity may then become infected and a septic empyema develop. There is also the danger from puncturing vessels and hæmorrhage. I have known hæmorrhage to be quite smart after the use of the exploring needle, although never fatal. Even if the pleural layers are adherent, infection may pass into the over-lying tissues of the chest wall and give rise to a phlegmonous inflammation.

The interesting relationship of bronchiectasis to lung abscess is, however, not alone in the question of differential diagnosis. Bronchiectic

conditions have been known to develop in the neighbourhood of a healed lung abscess as a result of shrinking of the scar tissues and dilatation of the adjacent bronchi. Such cases have been reported by Garré l.c., Helferich-Lichtenauer, Deutsche Zeitschrift f. Chir., Bd. 50, s. 389. Körte also reports a similar case upon which he had operated for acute abscess of the right lung. A month after the cavity was healed, the patient returned suffering from a recurrence of putrid expectoration. Seven months and a half after the first operation an incision was made through the scar and a system of dilated bronchi were found. He reports further three other cases of acute gangrene of the lung, where, in the region of the cavities at autopsy was found beginning dilatation of the bronchi where no healing process was apparent. Körte admits that there may have been in these cases a pre-existing bronchial dilatation which favoured the development of the gangrenous process. Tuberculous cavities are not suitable for operation.

Patients sometimes seem to develop gangrene without a pre-existing pneumonia or lung disease. Emboli may arise from a puerperal infection, retro-cæcal and appendiceal abscess. Embolic abscesses are frequently multiple and in that case are not adapted to surgical treatment. In one, inspiration of water while bathing was a cause. Typhoid fever, measles, facial erysipelas and bronchitis may be etiological factors; in one, tropical dysentery and liver abscess. In acute cases the abscesses are generally solitary.

When once the diagnosis is made and the cavity located it is unwise to delay operation because of the danger of hæmorrhage, extension of the disease in the lung, bursting into the pleura, and the occurrence of metastasis and sepsis.

Reasons which justify delay in operation are persistence of the acute pneumonic process and the desirability of having firm adhesions of the two pleural surfaces. These, however, should not be allowed to weigh against early evacuation of the pus when there are well-marked indications for the same.

In the early stages the abscess walls surrounding the tissue are softer and more yielding than they are later on.

In chronic abscess the conditions of healing are much less favourable, as the walls are hard and unyielding. To bring a chronic abscess to healing generally requires extensive resection of ribs and often of the thickened visceral pleura as well.

While it cannot be denied that certain cases recover after rupture of the abscess into the bronchus, yet experience has shown that this is an uncertain result, and that the mortality in unoperated is very much

larger than in operated cases. In diffuse bronchiectasis the conditions are quite different, the disease is not so localized—operation is not so satisfactory, and the prognosis is not so good. The drainage of localized bronchial dilatations is sometimes successful.

Resection of a whole lobe has sometimes been found necessary, and is sometimes followed by success. The operation, as a rule, is undertaken for the relief of abscess and gangrene.

Operations for the relief of large hæmorrhages are not easy. There is the difficulty of coming directly upon the bleeding point and the danger of the patient bleeding severely into the bronchial tubes while the operation is going on. If one is sure there is only one abscess from which the bleeding comes and if the physical signs and fluoroscopic examination show that the abscess is superficial and the patient's life is jeopardized by recurrence of large hæmorrhages, one might be justified in such instances in opening the cavity with a view of controlling the hæmorrhage by ligature, or by packing. If the cavities are multiple, or if the condition is one of the bronchiectasis, operation is certainly contra indicated. Nordman, in the Gaz. des Hôpitaux No. 87—1906, draws attention to the possibility of hæmorrhage occurring in cases of pulmonary gangrene, and to the small mention of this complication in the books. Lannec and Trousseau do not mention it at all. Grisolle, Eichhorst and Nothnagel simply refer to it. Hardy and Beheir on the contrary clearly indicate its importance and gravity. It must be divided into two forms: the small capillary hæmorrhages which are sufficiently frequent and the grave hæmorrhages due to rupture of large vessels, and which are generally fatal.

In some instances there may be some preparation made before operating. Only too often, however, patients are brought to the hospital in a desperate condition, and require immediate relief. When possible these patients should be prepared for operation in the usual way, with the added special preparation to get them to cough up as much as possible beforehand. Many of them know what position to assume to accomplish this end. They know that by turning on one side or the other—by lying on the back, or on the face, or by hanging the head low they can empty out a large quantity of matter, which renders the subsequent operation much safer.

I prefer, when possible, to operate under local anæsthesia, but this is difficult in the case of foreigners, who cannot be spoken to and encouraged in their own language. In such cases I use ether as being probably safer than chloroform, or any mixture containing chloroform.

After portions of one or two ribs are resected over the cavity, the next question is, are the layers of the pleura smelted together and adherent? Tuffier reports 215 cases in which the pleura was adherent in 190 or 95 per cent. It is not always easy to decide this point. Putting in a needle and expecting it to be moved up and down if the pleural surfaces are not adherent is an uncertain test, because it is almost impossible to stop the point of the needle just when it pierces the visceral pleura, and if it goes much further the lung tissues move it up and down. I have usually found that if the parietal pleura was thickened adhesions were present. If in doubt, and the patient's condition permits, one may remove one or more bits of rib and suture the two layers together as recommended by Pean, Tuffier and Roux. In suturing the pleural layers round needles are preferable, and Garré recommends inserting them during expiration and covering the pleura with the finger during inspiration. I have never known any infection to occur from this operation. If the condition is urgent, incision may be immediately made and the lung entered, but it is safer to wait for a couple of days for adhesion to take place. In other cases when in doubt I have applied the cautery, and in others simply packed the cavity tightly with iodoform gauze with equally satisfactory results. The first, however, is the procedure of choice. In one instance, when in doubt, I made a small puncture with the end of a knife—the entrance of a puff of air discovered that no adhesions were present. I packed the cavity with iodoform gauze, and three days later found adhesions sufficient to allow me to go in without any trouble.

If the pleura is accidentally opened and the lung recedes, W. Müller has found it possible to catch the receding lung with a pair of forceps and bring it back into the wound and suture the two pleural layers together. Incision through the lung tissue into the abscess cavity may be made in several ways. In some cases where the tissue is hard and dense, particularly if the fluorescopic examination has shown the abscess wall to be near the periphery of the lung, one may enter simply by blunt dissection. In these cases I have found it very satisfactory to first insert a director, and when entrance into the abscess cavity was demonstrated by the flow of pus, to pass a pair of narrow bladed forceps along the groove, and by separating the blades to secure an opening sufficiently large to permit the introduction of a finger for purposes of exploration. I have found this a valuable detail, as it enables one to determine the size and direction of the cavity and the location of any communication with a bronchial tube. In one of my cases I found the cavity. This patient did not do particularly well for some weeks after operation. When finally I made a second opening through the chest

wall into the lower end of the cavity, thus securing a dependent drainage, when the cavity closed rapidly, and the patient has remained well ever since. If there is much lung tissue to pass through in reaching the cavity a thermo-cautery enables one to enter with comparatively little loss of blood. An incision, however, may be made if good access has been obtained previously, and any bleeding points caught and ligatured.

In three of Körte's cases, sudden death occurred after operation from arrest of breathing with collapse. The first patient, who had had several hæmorrhages, was operated upon under local anæsthesia, morphia and local infiltration with eucain; a large gangrenous cavity was opened on the left side behind; the pleural layers were adherent. The patient did not suffer from any great pain and the bleeding was insignificant. The pulse was good and the operation was in every way successful. While the bandages were being applied and the patient in a partially elevated position, the breathing suddenly ceased, the pulse became bad and the patient died at once. The autopsy by Prof. Benda showed no good reason for the sudden death. The second case was being operated upon for the second time three months after the first operation. While the fistula was being enlarged under morphia and eucain infiltration, a few drops of chloroform having been given towards the end, breathing suddenly stopped, the pulse became bad and the man died. The autopsy by Prof. Benda showed many bronchiectic cavities in the left lower lobe, but no reason for the sudden death. The third was that of a man 52 years of age. The 6th and 7th ribs on the right side were resected under chloroform anæsthesia, the adherent pleural layers were excised and the bronchiectatic cavity opened. After the operation, just as the patient was being put to bed, breathing stopped, the pulse ceased. Artificial means, tracheotomy, inflation of lungs, venesection and saline infusion into the median vein restored breathing temporarily, but three hours later he died. Körte thinks the only explanation of these sudden deaths is through the reflex action of the pneumogastric nerves. He does not seem to think that the method of narcosis contributed in any way.

The after treatment consists in providing free drainage and easy emptying of the cavity. This is generally accomplished by the insertion of a soft rubber tube. At the time of the operation the cavity may be wiped out with gauze swabs, and sometimes a considerable mass of gangrenous tissue and shreds are wiped away in this way without causing hæmorrhage. Later during the period of granulation, healing may be promoted by packing with gauze, and by using tincture of iodine, nitrate of silver or balsam of Peru.

The incision of the tissues in the chest wall must not be allowed to close until the lung cavity is healed. Small hæmorrhages are not infrequent before operation, as has already been mentioned, and hæmorrhages of considerable quantity sometimes follow the use of the exploring needle. Hæmorrhages after operation and after the cavity is opened sometimes occur. In two of my cases the hæmorrhages were really severe. In one it was necessary to pack the cavity very tightly with gauze. When the packing was removed in 24 hours, bleeding recurred and a similar experience after the next 24 hours occurred. In this case good access had been obtained and one could distinctly see into the cavity where the bleeding was going on. It did not come from any spouter that could be seen, and was controlled with packing. After the third 24 hour interval no hæmorrhage occurred. In the second case although not severe it was necessary to keep the cavity packed 48 hours. If access has been good and a vessel is seen spouting there should be no difficulty in applying a ligature.

The wound has ultimately healed without permanent fistula in all of my cases in which there was not at the time of operation an accompanying empyema. Permanent fistula is rare and may be said not to occur in those cases in which the two pleural layers are adherent at the time of operation. If, however, before drainage is established, the abscess or cavity has burst into the pleura before the pleural layers were adherent, then the same rules for healing apply as for empyema. The visceral layer may become so thick as to seriously retard the expansion of the lung and the healing of the cavity. The cavity seems to close generally by granulation and scar tissue, gradually contracting and obliterating the opening. During this process, as has already been mentioned, the bronchial tubes in the neighbourhood may become stretched and dilated. Mikuliz has reported one and Körte two instances in which the cavity instead of being obliterated by contraction of scar tissue became covered with a layer of epithelium. All three cases occurred in the upper lobe where the anatomical difficulties of bringing about apposition of the walls and the spaces are present. If there has been much contraction during the healing process there will be the usual flattening of the chest and alterations in the spinal curves. In only one instance was I obliged to operate the second time, and that, as has already been mentioned, was where the drainage and the bronchial tube were both from the upper end of the cavity. So far as we have been able to trace these cases the recovery has been permanent—no cough or bronchitis being complained of.

No. 3 died suddenly a month after operation from ulceration with erosion of a branch of the pulmonary artery.

No. 6. In this case the accompanying condition and contributory causes of death were acute miliary tuberculosis of the peritoneum; fatty heart, septic splenitis; peri-splenic abscess and acute parenchymatous nephritis.

No. 13 was a case of bilateral bronchiectasis with fœtid bronchitis in which I drained one side. He died from asthenia on the fifth day after operation.

No. 14. Contributory causes of death were broncho-pneumonia; emphysema of lungs; chronic interstitial nephritis; acute interstitial nephritis and fatty liver.

Resection of one lobe of the lung has been carried out by Kummell, Gluck Krause and Heidenhain. Garré and Lenhartz seem to think it the only rational procedure in certain extreme cases with a limited disease. It is said to be feasible and may be carried out largely by ligature *en masse*. So far, I have had no experience with this procedure. Good access obtained by the removal of portions of several ribs would seem to be a necessary detail, thus securing control of the field of operation.

In conclusion it may be said that while some lung abscesses and some localized bronchiectatic cavities may, under favourable circumstances, when communicating freely with a large bronchus, empty themselves sufficiently to permit of cure, yet on the whole the results of medical treatment only in lung abscess and gangrene are bad. Much better results are obtained by incision and drainage, so that not more than a few weeks should be spent in medical treatment. Operation in a rarified atmosphere, from what I saw of the method in Breslau, and from what I have read of it since seems to promise a good deal, and should enable one to operate on these cases more independently of the union of the two layers of the pleura, and enable one more freely to explore the cavity, to ligature, suture, and to do better work generally.

The mortality in lung abscess and gangrene varies under surgical treatment. In 28 cases following pneumonia operated on by Körte 20 recovered and eight died, a mortality of 28½ per cent. Of eight cases of putrid empyema associated with gangrene one recovered and seven died, a mortality of 87 per cent.

Tilton reports a mortality of 50 per cent. in 20 cases. In the 14 cases reported in this paper including one of putrid empyema there were four deaths, a mortality of 28½ per cent.

The case complicated by putrid empyema is making a very satisfactory recovery, but further operation may be necessary to obliterate the pleural cavity, as the lung is tightly bound down and is expanding very slowly.

The following brief reports of 14 cases:

Case I.—Male aged 38. Dr. Lafleur. Alcoholic and epileptic. Gangrene. Following a prolonged spree developed a severe pain in the side and began expectorating blood-stained greenish sputum, measuring 20 to 25 oz. in 24 hours. Cavity $2\frac{1}{2}$x$2\frac{1}{2}$ inches with smooth walls opening into a bronchus from the upper corner. The pleural surfaces were adherent. Drainage. Recovered. His habits were such as would point the clinical history to this being originally an aspiration pneumonia. The absence of elastic tissue and the smooth walls of the cavity suggest bronchiectasis, but the gangrenous odour of the sputum, the fever and the pleurisy point to its being gangrene.

Case II.—Male aged 33. Dr. Molson. Alcoholic. Illness began with chills and rigors. Two months after had chills with profuse perspiration and fœtid expectoration. Signs of consolidation in the right lung, but difficult to localize. The sputum had a gangrenous offensive odour and contained elastic tissue. The patient was transferred to the surgical service and rib resected. Drainage. Recovery.

Case III.—Male aged 48. Dr. Finley. No alcohol nor epilepsy. Illness began with chill followed by daily chills and night sweats. Signs of cavity at the base of the upper lobe of the left lung. Fluorescopic examination showed a shadow in this region and foul pus was drawn by the exploring needle. Sputum frothy mucopurulent, and contained elastic tissue. Patient was transferred to the surgical service, where, previous to operation, he expectorated 40 ounces of fœtid sputum. At the operation a large gangrenous cavity was explored and packed with gauze. The patient improved, but died suddenly a month later from ulceration of the posterior left apex with erosion of a branch of the pulmonary artery.

Case IV.—Male aged 45. Dr. Ridley MacKenzie. Alveolar abscess causing trismus. Dr. MacKenzie administered ether to relax the jaw, and the removal of the tooth liberated a lot of foul smelling pus, and a sub-maxillary abscess formed later which was opened. Three weeks afterwards dry friction rub of the right side which improved after strapping. A week later a dull area developed with signs of consolidation and gangrenous expectoration. An exploratory aspiration was performed below the angle of the scapula and gangrenous foul smelling pus was found. The expectoration was profuse and gangrenous, but no elastic tissue was found. He was transferred to the surgical service and a piece of the 9th rib excised, and a fœtid smelling abscess was opened lying between the diaphragm and the lung, almost fæcal in character. Drainage. Recovery. The man is now in perfect health.

Case V.—Female 26. Dr. Ridley MacKenzie. Illness commenced with alveolar abscess in the upper jaw. The tooth was removed under

an anæsthetic, the anæsthetic being prolonged preparing the teeth for bridge-work. A week later a pleuritic friction rub developed in the right axillary region, followed by signs of consolidation with blowing breathing, accompanied by muco-purulent fœtid expectoration, but no elastic tissue. An effusion developed, and gangrenous pus was aspirated. Resection of the 9th rib liberated a large quantity of greenish gangrenous pus. The pleural layers were adherent, the lung cavity presenting irregular sloughing walls. The patient's condition was very bad. She was septic with acute dilatation of the heart. The apex of the heart was in the anterior axillary line and the pulse was not countable. Good drainage was secured, and expectoration ceased and the patient's recovery was perfect. Dr. MacKenzie accordingly regards this condition as one secondary to aspiration-pneumonia, the gangrenous abscess not being in direct communication with a bronchus. It was in the outer aspect of the lung, rupturing into the pleural cavity.

Case VI.—Aged 20. Died April 1st, 1907. Primary tuberculosis of the ovary resulting in acute miliary tuberculosis of the peritoneum. Gangrene of the lung. Right inguinal fistula. Acute fibrinous pleuritis. Fatty heart. Septic splenitis. Peri-splenic abscess and acute parenchymatous nephritis. The patient was a very large fat girl, weighing about 180 pounds.

Case VII.—Age 31. Pulmonary abscess. Chloroform anæsthesia. Was discharged well and gained in weight. Incision 2½ inches long of the 8th rib in scapula line. Rib resected. Pleural layers adherent. Abscess approached by blunt dissection and one ounce of pus evacuated. Tube put in. On November 14th, the abscess was re-entered and 150 c.c. of bloody fluid withdrawn.

On October 14th, the patient was brought to the Hospital, having fallen about 40 feet and was bruised and sore, especially over the back and abdomen. There was a hæmatoma of the left side of the neck. This was followed by an abortive attack of pneumonia mainly confined to the base of the left lung. Pleurisy followed this with effusion. Pleural surface adherent. No tubercle bacilli were found. Elastic tissue was present. Recovered.

Case VIII.—Age 29. Pulmonary abscess. Lobar pneumonia. Marked scoliosis. Diminished expansion. Resection of 8th rib—left side in scapular line. Pleural surface adherent. Pulmonary abscess opened by blunt dissection. About one ounce of greenish pus evacuated. Illness began with pain in the left side and cough.

On admission to the Hospital there was a friction rub over the left anterior axillary line. Cough with muco-purulent bloody sputum.

Developed from lobar pneumonia left side and septicemia. Culture obtained—Staphylococcus pyogenes albut-Streptococcus pyogenes. No tubercle bacilli.

Case IX.—Mrs. J. M., age 39. Pulmonary abscess. Complication, Hæmorrhage. Recovery. A small opening still persists at the time of discharge, but the patient feels very well.

Part of the 8th rib resected in scapular line. Pleural layers adherent. Pulmonary abscess opened by blunt dissection, 6 oz. dirty pus evacuated. Tube inserted. Examination through this by reflected light showed a pulmonary abscess immediately in front of incision.

The patient was confined December 1st. On December 3rd, had a chill and a second one on the following day, accompanied by very sudden and severe pain in her right side far down towards the base of the chest and thorax. Had no cough or expectoration with pain. Severe headache after the chill and very feverish. On December 4th she spat up a mouthful of blood-stained material. Was brought to the Hospital on the same day. Would seem to be embolic in origin. The pulmonary abscess was opened on December 13th. On the 21st and 23rd of December there were profuse hæmorrhages from the pulmonary cavity, requiring packing twice a day with gauze. Calcium lactate and stimulants were administered.

Case X.—Mrs. K., age 26. Operation 15th November. Abscess of right lung. Abscess of three months' duration. Fœtid expectoration and pneumococcus—no tbc.—a great deal of elastic tissue. Abscess located in the right base. The aspirating needle was used to locate it exactly. Several punctures were made before it was found just under the spine of the scapula. Very little pus was aspirated. Incision 3 inches long over the 8th rib and 2 inches resected. Pleural layers adherent. Pleural surfaces seemed to be moving freely over each other, and an actual cauteral was applied with a view of promoting a pleuritis. The wound was then plugged with iodoform and gauze.

On November 13th had quite a large hæmorrhage. There was considerable difficulty in locating abscess, but finally a tube was inserted.

Present illness began on the 2nd of March, shortly after an operation for the removal of the left eye. On March 5th, pain developed in the right side of the chest, followed by cough and expectoration.

About May 1st, sputum was blood-stained, and May 12th, she spat up a wine glassful of bright red blood, and was admitted to the Hospital where she remained till July 25th. The diagnosis at this time was fœtid bronchitis. Came back September 27th saying that she had another hæmorrhage the day before, spitting up a half cup of bright red

blood after a fit of coughing. Examination proved negative. Discharged improved 5th October, 1907.

On October 23rd, she began to notice blood in the sputum. In the evening she coughed up two or three spoonsful of bright red blood.

Case XI.—W. P., age 27. Was very healthy until two years ago, when he began to have epileptic attacks which persisted ever since. Has used alcohol in excess for past seven years in all forms. No venereal history.

On December 23rd, 1907, sudden sharp catchy pain in left side, so severe that it kept him awake at night. Next morning pain was easier and he worked all day. December 26th, when entering his house, tripped and fell to the ground striking his head. Walked four or five steps and fell in an epileptic convulsion—became unconscious and rigid all over and remained so for three minutes. During the attack he frothed at the mouth, bit his tongue and passed urine. Had three more similar convulsions the same night.

On January 14th, pain in the left side became more severe and required morphia to relieve it. This pain had been present a little more or less since it first started. January 15th, breathing rapid, and pain present, but not very severe. January 20th, coughed and expectorated a large quantity of very effusive thick greenish matter. Later the sputum became watery. In bed since January 14th. Well-marked pyo-pneumothorax. No tubercle bacilli.

Operation: Two inches of the 8th rib resected in the line of the angle of the scapula. About eight oz. of foul-smelling sero-purulent material was evacuated. I think this was the most horrible fœtid stuff that I have ever had to do with in my hospital experience, and continued so for 10 days or a fortnight. Recovery.

Case XII.—Male aged 28. Inmate of Verdun. Epileptic. Large pulmonary abscess—left side. Excised portion of 8th rib in line of angle of scapula. Fœtid ichorous pus and air escaped from cavity. On introducing the finger, cavity was found to be the size of a small orange and to be especially connected with the upper surface of the lower lobe. The two lobes were quite separate, the abscess evidently lying between the two, but apparently taking origin from the lower. The cavity was wiped out and drainage established. Recovery.

Case XIII.—E. J., aged 45. Bronchiectasis: autopsy. Diagnosis. While working in bush got wet from which an attack of pleurisy followed some three years ago, and was in R. V. H., Montreal, eight months. Previous to entering the hospital, would spit up pus and blood as much as a tumblerful. Expectoration greenish, not fœtid. No pain. Matter rises up in throat whenever he stoops down.

Operation: Left lung. Died fifth day after operation.

Case VII.—Dr. Finley. M. W., age 38. Abscess of lung. Operation: Resection of ribs and suturing of pleura. Temperate in habits. Illness began about a month previous to operation after a bad wetting which was followed by a severe cold. Had no chills nor pain except when coughing. During severe fits of coughing expectorated about a pint of almost pure blood in a night, sputum rancid, tenacious, rusty coloured and foul-smelling. Neither tubercle bacilli nor elastic tissue. Behind right lung area of dulness beginning at 4th dorsal spine above and extending downward for about 4 in. Died day after operation.

Autopsy:—Abscess R. Lung (upper pt. lower lobe); bronchopneumonia (all stages) (left lung L. lobe); emphysema and blood of lungs; old adhesive pleurisy; acute muco-purulent bronchitis; thoracotomy: chronic interstitial nephritis and acute interstitial nephritis; cysts of pelvic kidney wall and of trigone of bladder. Fatty liver: Suppuration of gland at base of appendix and of bronchial glands.

Greater New York Number.—An unusual feature of medical journalism will be presented in the March issue of the AMERICAN JOURNAL OF SURGERY. The entire original subject matter in this issue will be contributed by New York City surgeons of note, and a number of new operations will be first presented therein. Among the contributions to appear are: "A New and Simple Method of Intestinal Anastomosis" (illustrated), Howard Lilienthal, M.D., attending surgeon, Mt. Sinai Hospital. "Sigmoiditis and Perisigmoiditis, James P. Tuttle, M.D., Professor of Rectal Surgery, N.Y. Polyclinic, New York. "Sacral Suspension of the Uterus—A New Technic" (illustrated), James Van Doren Young, M.D., surgeon, St. Elizabeth Hospital, New York. "Cancer of the Breast," Willy Meyer, M.D., Professor of Surgery, Post-Graduate Medical School; attending surgeon of German Hospital, New York. "A Modified Operation for Inguinal Hernia" (illustrated), Albert E. Sellenings, M.D., New York. "The Localization and Removal of Foreign Bodies with Especial Reference to those in the Skeletal Tissues" (illustrated), Dr. Walter M. Brickner, Assistant Adjunct Surgeon, Mt. Sinai Hospital; Editor-in-chief "American Journal of Surgery," New York. "An Operation for Direct Blood Transfusion with a Description of a Simple Method," John A. Hartwell, M.D., attending surgeon to Bellevue Hospital, New York. "Plastic Mastoid Operation: A New Method of Operating in Acute Mastoiditis," T. F. Hopkins, M.D., Assistant Surgeon Oral., N.Y. Eye and Ear Infirmary, New York. "Dislocation of the Cervical Vertebrae" (illustrated), James P. Warbasse, M.D.

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DR. C. W. DUVAL'S DEPARTURE.

We regret that the Montreal General Hospital and McGill University are about to lose the services of Dr. Charles W. Duval, who has for the last two years and a half been Pathologist at the former institution and lecturer in Pathology at the latter. Of late, Dr. Duval's collegiate duties had been transferred to the department of Histology. Dr. Duval has been appointed Professor of Pathology in Tulane University, New Orleans, and his position there will place him in a place of larger responsibility and greater opportunity, upon which we offer him our heartiest congratulations. At the same time we regret that his advancement entails our loss, for the institutions with which he has been connected, and his colleagues with whom he has associated have profited by his presence and assistance. An enthusiastic bacteriologist and a faultless laboratory technician, Dr. Duval's influence has made itself felt not only upon those who have worked under him, but also upon his colleagues who have been stimulated by his example as well as assisted by his knowledge. We extend to Dr. Duval our best wishes for his continued prosperity.

TYPHOID FEVER IN MONTREAL.

There is something which is worthy of wonder in the fatalism with which Montreal accepts its annual scourging of typhoid fever, as if it were the will of Providence which should be endured with proper

submission. On January 17th the hospitals contained 255 cases of the disease, and on that day six new cases came in. So far as we are able to learn, no enquiry has been undertaken which, in the least degree probable, is likely to lead to useful information. The civic health officer, without committing himself to an opinion, refers to a "theory" that "typhoid is in the air"; but he has not called upon the authorities to supply him with the means of making further investigations.

The Medico-Chirurgical Society, by a committee, has gone to the length of making some observations upon the water supply. The value of this means of sanitation is by no means to be despised, but anyone who is in the habit of drinking water from the tap may be trusted to make observations upon the subject for himself, which are more expressive of the situation than the scholarly considerations of the committee.

The *Standard* with most commendable zeal has undertaken an investigation on its own account. The remarkable feature about its report is that in one sample no colon bacilli were found. The performance of civic duties by newspapers has much to recommend it, though zeal does not always take the place of scientific exactitude. An investigation can hardly be accepted as final, in which we are informed that a cubic centimetre is "equal to about two square inches."

We have nothing but praise for the efforts of the same newspaper in exposing the foul conditions under which the milk-supply is obtained, though it does produce a feeling of disgust at the sight of the cream-pitcher. The array of figures which it sets forth may arouse some qualms of conscience in the milkmen, though we can scarcely expect that it will stimulate the authorities to a show of activity. They look upon it as a feat in municipal management that they should supply any water whatever.

INSANITY IN MONTREAL.

In the annual report of the Hospital for Insane, Dr. T. J. Burgess, the superintendent, comments upon the increase of insanity. There were in the hospital on January 1st, 1908, 535 patients, inclusive of two out on trial, and during the year there were admitted 197, making a total under treatment of 732. Patients discharged numbered 109, 36 died and one escaped, leaving in residence at the close of the year 582 patients, exclusive of four out on trial. This was a net increase of 47, as against 26 in the previous year, and represented the largest number that had been under care since the opening of the institution.

This large addition was due in his estimation, to the inferior class of

immigrants landed on our shores. Through the action of the Immigration Department fifteen inmates of the hospital were deported last year, but a careful examination of records revealed the fact that seven per cent. of the patients still in residence either should never have been admitted into the country, or should have been deported. At the present moment nearly 39 per cent. of the inmates were of foreign birth, and among them were a number who, it was almost certain, fell within the scope of the deportation laws.

Reviews and Notices of Books.

DISEASES OF THE NOSE, THROAT AND EAR, MEDICAL AND SURGICAL, by WILLIAM L. BALLENGER, M.D., illustrated with 471 engravings and 16 plates. Lea & Febiger, Philadelphia & New York, 1908.

A new work, superadding itself to the already rich literature on the nose, throat and ear, should justify its creation by some special features which may claim the attention of students and practitioners. Accordingly, it may be said of the present volume, in the first place, that it includes the whole range of these three subjects, instead of dealing fully with the nose and throat, and only with the associated affections of the ear. It is no longer necessary to explain the advantages of considering these closely interrelated separately without missing most important connexions. The relation of the eye to diseases of the sinuses is also introduced, though the significance of its relationship is not yet fully understood. Moreover, our knowledge of the inflammatory diseases of the nose and accessory sinuses, and of the throat and ear, has been increasing with such strides that the time seems to have arrived for presenting the subject on a new and higher plane. The causes of infection and inflammation of the cavities lined with mucous membrane are better understood, and it has accordingly become possible to give them in their true relation to the diseases. Instead of their mere enumeration, each has been discussed here with the purpose of showing its exact relation to the disease under consideration.

The attempt has been made to show the effects of anatomical and pathological obstructions in the various portions of the nasal chambers upon chronic catarrhal inflammations of the nose and upon chronic catarrhal and suppurative inflammations of the accessory sinuses. The advantage of this viewpoint is that it affords a more satisfactory explanation of the etiology and rationale of the treatment of infectious and inflammatory diseases of all three regions.

The author has long believed that surgical technique could be most clearly elucidated by describing each step of the various operations in numbered paragraphs and by complementing them with suitable drawings. Nearly every operation is therefore illustrated, some with more than twenty drawings.

Tracheo-bronchoscopy and œsophagoscopy have been brought to such a high degree of perfection and the occasions for this employment are so numerous, that a fully illustrated chapter is devoted to their consideration.

Dr. Ballenger is to be congratulated in carrying out to the smallest details the work thus outlined in the preface. It is the results of many years of experience and was several years in the course of preparation. It is questionable, however, whether so extensive a work as this is suited to the needs of the general practitioner and the medical student, but rather to the specialist in these departments of medicine. It is to be regretted that more reference has not been made to the work of Continental writers, especially in the advances recently made in diseases of the internal ear. The work reflects great credit upon the publishers and the book will be found to be a valuable addition to the specialist's library.

A Manual of Diseases of the Nose and Throat, by Cornelius G. Coakley, A.M., M.D., 4th Edition, revised and enlarged, illustrated with 128 engravings and 7 colored plates. Lea & Febiger, New York and Philadelphia, 1908.

The author is to be congratulated upon the appearance of a fourth edition of his work in so short a time succeeding the last, and it speaks volumes for the popularity of the work. The book has indeed been written with the idea of meeting the requirements of the general practitioner. Each article has been carefully considered and changes made to conform to the advances in diagnosis and treatment. The article on deformities of the septum in the present edition includes spurs and deflection of the septum, which we think has simplified the subject considerably. The technique of the radical operation has been more fully described than in previous editions. The work is entirely up to date and we strongly recommend it for those whom it is especially written for, *viz*: the medical student and the general practitioner.

Gonorrhœa in Women. By Palmer Finley, M.D. Professor of Gynæcology in the College of Medicine in the University of Nebraska, Omaha. Gynæcologist to the Clarkson Memorial Hospital and Wise Memorial Hospital; Fellow of the American Gynæcological Society. C. V. Mosby Publishing Co., St. Louis, Mo.

This is a neat book of 110 pages, including the Bibliography and Index, printed on good paper and well bound. There are chapters on the history, etiology, pathology, diagnosis, effects on society, and treatment. The author quotes very extensively from Morrow to show the great danger of men marrying before the disease has been cured. He lays great stress on diagnosing by means of the microscope and Gram's stain. He points out the curious fact that a husband and wife can have gonorrhœa without knowing it, but if a third person has connexion with one of them it will be promptly followed by the most severe symptoms. He explains this by their being accustomed to or immune from infection. There is a short chapter on prevention in which he recommends the physician to inform all parties concerned so that if married they may live apart, or if engaged their engagement may be broken off. But he says nothing of any mechanical means of preventing infection, although he is known to be a great advocate of rubber gloves in abdominal surgery. He quotes at length from Grandin, of New York, to show that more care should be taken to prevent men from infecting prostitues, instead of taking so much trouble, in examining the latter, which is ineffective. He quotes from Boldt for treatment of the urethra, a quarter of one per cent. of protargol solution. The chapter on systemic infection is particularly good. For gonorrhœal rheumatism he recommends arsenic and iron, salicylates being of no avail.

A. L. T.

On "Infantilism from Chronic Intestinal Infection," by C. A. Herter, M.D., published by the MacMillan Co., New York. 118 pages.

This is a monograph of a study of the clinical course, bacteriology, chemistry, and therapeutics of arrested development in infancy. The work is based upon five cases more or less typical which have come under the author's observation. Another group of five cases of shorter duration and running an acute course are included in this study.

Most of these patients were under the care of Dr. L. Emmett Holt whose assistance the author acknowledges at the outset of his work.

The study is most painstaking and thorough, and the author concludes that the pathological state giving rise to what he calls "infantilism" is primarily due to the over growth and persistence of bacterial flora, belonging normally to the nursling period, which give rise to a chronic intestinal infection.

The author states that the chief manifestations of intestinal infantilism are "arrest in the development of the body; maintenance of good mental power, and a fair development of the brain; marked abdominal

distension; a slight or considerable degree of anæmia; the rapid onset of physical and mental fatigue; irregularities or intestinal digestion resulting in frequent diarrhœal seizures." The organisms concerned are the Bacillus bifidus type, the Bacillus infantilis type and the coccal type. The absence of the B. coli and the B. lactis ærogenes type, not only from the fæces but from material collected through the use of a cathartic is noteworthy. The urine changes are characteristic.

Fat is in excess in the stools. There is an excess of calcium and magnesium in the fæces which accounts for the impaired skeletal growth.

The author considers that there is no evidence present that infantilism has any other origin than a purely intestinal one.

The author's use of the word "infantilism" in these cases is possibly open to some criticism, as the term is usually applied to those cases in which the persistence of the mental attributes, as well as the physical of early childhood persist after puberty.

However, the class of cases dealt with has received considerable attention from several writers, and the chronic malnutrition resulting from intestinal indigestion in young children forms a very common clinical entity to those who are called upon to attend children's diseases. To such Dr. Herter's little book will prove most interesting and instructive reading.

The whole study is of the very best type of modern medicine which we commend heartily to those interested in children's diseases.

Obstetrics for Nurses. By Joseph B. DeLee, M.D., Professor of Obstetrics in the Northwestern University Medical School, Chicago. Third Revised Edition. 12 mo of 512 pages, fully illustrated. Philadelphia and London: W. B. Saunders Company 1908. Cloth $2.50 net. Philadelphia, London; W. B. Saunders Company; Canadian agent, J. A. Carveth & Co., Limited, Toronto.

The third edition of this well-known book has been brought up-to-date, the chief improvement being in the glossary. No maternity nurse who wishes to keep abreast of the times can afford to be without a copy of this book for frequent reference. In the training schools it is simply invaluable.

Text-Book of Nervous Diseases and Psychiatry. By Charles L. Dana, A.M., M.D., LL.D. Professor of Nervous Diseases in Cornell University Medical College; Visiting Physician to Bellevue Hospital; Neurologist to the Montefiore Hospital; Neurologist to the Woman's Hospital; Consulting Physician to t' Manhattan State Hospital; ex-President of the American Ner ological Asso-

ciation; ex-President of the New York Academy of Medicine; Corresponding Member of the Société de Neurologie, etc. Seventh Edition. 782 pages 8 vo. 261 engravings and 3 plates. William Wood and Company, New York. Price, $5.00 nett.

In the present edition, which has been largely rewritten, much new matter has been incorporated, but enough old or unimportant material has been omitted to prevent any material enlargement of the book.

Conciseness—which, however, has not been permitted to interfere with clearness—has been the author's watch-word, and it is difficult to to see how, within the limits he has set for himself, he could better have carried out his aim of furnishing "a book.....suitable for the student and practitioner and not valueless to the specialist." The work is throughout such an excellent one that it is difficult to particularise. The chapter on Anatomy and Physiology of the Brain is highly to be commended. A series of case reports illustrative of various forms of mental disease has been added and forms a helpful feature of the section on Psychiatry. The illustrations are clear and helpful and the printing and binding good.

One could wish to see some reference made to Edinger's nerve exhaustion theory in relation to tabes, and it is impossible to treat the subject of brain tumours adequately in the space of 20 pages; but the faults of this capital work are essentially those of over-condensation, and a remarkable amount of information has been compressed into its comparatively small bulk.

PROGRESSIVE MEDICINE, VOL. IV, DECEMBER, 1908. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Octavo, 333 pages, with 26 engravings and 2 colored plates. Per annum, in four-bound volumes, containing over 1,200 pages, $6.00, net; in cloth, $9.00 net. Lea & Febiger, Publishers, Philadelphia and New York.

The Contents of Volume IV are:—"Diseases of The Digestive Tract and Allied Organs, The Liver and Pancreas," by David L. Edsall, M.D.; "Diseases of the Kidneys," by John Rose Bradford, M.D., F.R.C.P.; "Surgery of the Extremities, Tumours, Surgery of Joints, Shock, Anesthesia, and Infections," by Joseph C. Bloodgood, M.D.; "Genito-Urinary Diseases," by William T. Belfield, M.D.; "Practical Therapeutic Referendum," by H. R. M. Landis, M.D. An Index completes the volume.

Dr. Edsall who belongs to the Philadelphia School describes the clinical bearings of recent physiological research on the stomach and of psychic influences on digestion. His investigation of the diseases of the pancreas is peculiarly illuminating. Dr. Bloodgood's contribution covers the progress of surgery during the year with special reference to the surgery of the blood-vessels and joints. He devotes 20 pages to tumours and completes a most important monograph on the subject. The writers have taken knowledge of the best medical literature and present a concise statement of the latest developments in the whole field of medicine. This publication is so well known that one needs do nothing more than call attention to its contents.

SURGICAL MEMOIRS AND OTHER ESSAYS, by JAMES G. MUMFORD, M.D. Instructor in Surgery, Harvard Medical School. Publishers, Moffat, Yard and Company, New York. Illustrated. 1908.

This is a book by a scholar who has a nice taste for subject and a fine perception of the meaning of words. It contains 18 essays, seven of which are of ancient historical interest; these include a consideration of Hippocrates, Galen, Versalius, Ambroise Paré, Von Haller, John Hunter and Joseph Lister; but one turns with even greater interest to his accounts of the American surgeons, John Collins Warren and Jacob Biglow. There is a peculiar interest in the description of early American surgery, which is marked by sound scholarship and careful research. The memoir of John Collins Warren is done with affection and grace, and it conveys a singularly clear notion of the practice of the time. As early as the end of the eighteenth century Dr. Warren observed that "one of the great traits of the manners of the time was the way in which young persons were accustomed to treat persons older than themselves," which shows that young persons in those days were much the same as they are in these. We commend the book to anyone who desires a quiet and pleasant evening. It is full of matter, and the presentment of it will be found a relief to those who are obliged to read many works on modern medicine.

THE NATIONAL STANDARD DISPENSATORY, Containing the Natural History, Chemistry, Pharmacy, Actions and Uses, of Medicines; by HOBART AMORY HARE B.Sc., M.D., CHARLES CASPARI, Jr., Ph.G., Phar. D., and HENRY H. RUSBY, M.D., Second edition, thoroughly revised and much enlarged. Lea and Febiger, Philadelphia and New York, 1909. Cloth $6.00 net. Full leather $7.00.

This is a splendid volume of over 2,000 pages with 478 engravings. There is a general index of 123 pages of three columns each containing the names of drugs in all the modern languages. There is a therapeutic

index of 20 pages of three columns each arranged under "Diseases." The use of this book extends far beyond the medical profession and is essential to all who have to do in any way with drugs. Of the high authority of any work emanating from Hare, Caspari, Rusby, Greisler, Kremers, and Base, it is unnecessary to speak. In short, this great encyclopedia of the latest pharmacology, pharmacy, and therapeutics is recognized as the leading reference for every one concerned with drugs, their manufacture, dispensing, and medicinal uses.

TRANSACTIONS OF THE AMERICAN SURGICAL ASSOCIATION, Vol. XXVI., 1908, W. J. DORNWN, 701 Arch. St., Philadelphia.

This volume, the twenty-sixth, is edited for the American Surgical Association by Richard H. Harte, M.D., and contains a record of the transactions of the meeting held in May, 1908. In the Obituary notices we find mention of Markoe, Brinton, Senn, Annandale, and Von Esmarch. At page 324 we note a paper by George E. Armstrong, M.D., upon "The Diagnosis and Prognosis of Tuberculosis in Sceptic Conditions of the Kidney." At page 372 there is a paper by Francis J. Shepherd, M.D., upon a case of "Melanotoic Sarcoma of the common bile duct and the ampulla of Vater. The amount of work presented and the quality of it is entirely creditable to American Surgery.

THE SEXUAL DISABILITIES OF MAN, by ARTHUR COOPER, Consulting Surgeon to the Westminster General Dispensary; formerly House Surgeon to the Male Lock Hospital, London. H. K. Lewis, 136 Gower St., London, W.C., 1908.

We have never been able to satisfy ourselves that matters of the nature of those contained in this book required consideration apart from the general subjects of medicine and surgery. There is in the book much of surmise and much repetition of statements which have gained currency without sufficient examination.

Medical News.

In connection with the meeting of the British Association for the Advancement of Science to be held in Winnipeg, August 25th to September 1st, 1909, the office of the Honorary Local Secretaries has been organized in the University Building. All enquiries and communications on matters connected with the meeting should be addressed: To the Local Secretaries, British Association for the Advancement of Science, University of Manitoba, Winnipeg.

REPORT ON MONTREAL WATER.

The Montreal Medico-Chirurgical Society appointed a committee to make a report upon the supply of water to Montreal. The report was presented at the meeting of January 8th, and is as follows:—Your committee find that there is a very general and growing interest in the water supply of cities and towns; that the people rightly demand a plentiful supply of pure water that they and their children may use with impunity, and the state is recognizing more and more the importance of supplying to the people a liberal quantity of pure water for economic reasons.

There would seem to be a great unanimity of opinion with regard to the method of obtaining a good water supply That obtained from watersheds has proved expensive, difficult to control, and unsatisfactory in its purity. The most satisfactory results are obtained from earth water and filtered water.

In Europe, the filtration of the public water supply has been in use for more than 75 years. In Germany it has now been made practically obligatory on cities by the Imperial Board of Health. Indeed, the adoption of filters in Europe is not confined to thickly populated districts, the city of Liverpool takes its water supply from an almost uninhabited district in the Welsh mountains. This water, however, is carefully filtered.

One or two instances will illustrate very clearly the benefits derived from filtration of the public water supply. The death rate from typhoid per 100,000 of the population before and after filtration in the city of Lawrence is an example.

Before.		After.	
1889	127	1894	47
1890	134	1895	31
1891	119	1896	19
1892	105	1897	16
1893	80	1898	16

The city of Albany affords another instructive example. During the five years before the filtration of the water supply was carried out the death-rate from typhoid was:

Before.		After.	
1895	119	1900	37
1896	64	1901	21
1897	80	1902	28
1898	87	1903	19
1899	69	1904	19
		1905	19
		1906	16
		1907	20

This is a very marked reduction, although it must be noted that one-third of the water supply of Albany is unfiltered water from gravity streams.

If we now look across the water, we find that the death rate from typhoid per 100,000 of the population is:

Berlin	8
Breslau	10
The Hague	6
London	15
Rotterdam	5
Zurich	8

Perhaps the most striking illustration of the benefits of filtration was afforded by the well-known experience of the cities of Hamburg and Altona during the cholera epidemic of 1892. These cities are situated side by side on the right bank of the Elbe, and both take their water supplies from that stream, the Altona intake being placed but a few miles below the point where the sewers of Hamburg discharge into the Elbe the sewage of nearly 800,000 people. The two cities are practically one being built thoroughly to the dividing line on both sides. In the winter of 1892-93, when the cholera visited the valley of the Elbe, Hamburg, which used the unfiltered water of the Elbe, suffered severely, as is well known, from the disease, while Altona, which used the same water, after it had been further polluted by the cholera polluted sewage of Hamburg, but filtered it, had only a relatively few scattered cases, which were generally traceable to the use of Hamburg water by transient visitors to the adjoining city.

The Montreal death rate from typhoid per 100,000 of the population was as follows:—

1903— 90	31.45	per	100,000
1904— 94	31.89	"	"
1905— 55	18.11	"	"
1906—130	37.08	"	"
1907—122	33.26	"	"

The difficulty of finding typhoid germs in the suspected water has sometimes raised the question as to whether the water supply was responsible for the typhoid fever so prevalent in so many cities. In these conditions it must be remembered that the germs probably enter the water only at intervals, and pass away. As to how long they can live in the water will depend very largely on the amount of food, the temperature and other factors in the water. There seems to be some difference of opinion among authorities as to how far running water purifies itself, particularly when flowing over rapids.

Dr. Thos. Darlington, Commissioner of Health, New York city, states that, "It is an old but fallacious idea that flowing water purifies itself. Within a short distance of its course the impurities discoverable by chemical methods may be entirely lost; bacteriologically, or rather, from a pathogenic standpoint, however, it does not change perceptibly."

Pittsburg, Philadelphia, and Washington are now expending large sums of money in establishing filtration plants for their entire water supplies. Filtration will remove 98-100 of the bacteria from the water. Over 500 cities and villages in the United States have filtration plants, and many more are in the process of construction.

The milk supply is often responsible for the spread of typhoid, but, on the other hand, the milk itself is contaminated by the water. The contamination of the water in the country districts is often due, doubtless, to the people who contract typhoid in the cities. The benefits arising from a supply of filtered water are no longer matters of debate, but have been demonstrated by the large number of cities and villages that have already adopted the system.

Your committee are of the opinion that this society should now act with a view of influencing the City Council and demonstrating to the citizens and aldermen of Montreal the advantages of a liberal supply of filtered water, and the advisability of taking steps to secure it. Your committee think that it might be advisable for this society to invite the co-operation of the Society of Civil Engineers, with a view to determine more definitely the best means of securing a supply of pure water. It has also been thought by the committee that it would be well, also to invite the co-operation of the French Medical Society.

WESTERN HOSPITAL.

The annual meeting of the Western Hospital was held January 19th, 1909. Dr. F. J. Hackett read the medical report.

During the year there were treated 1,361 patients, an increase of 639 over the previous year. Of these 1,361, 797 were Protestants, 488 Catholics, 72 Jews, and 4 of other faiths; 478 were medical cases, 754 surgical; 1,289 were from Montreal and 73 from other outlying districts. There were 702 men and 589 women and 70 children under twelve years of age. Of the 61 deaths occurring during the year, 21 took place within 48 hours of admission into the institution, making the death rate 4.48 in all, or 2.93 over 48 hours' admission.

The general secretary's report, read by Dr. George T. Ross, showed that the last year had been the best one in the history of the hospital. While the increase in the out-door department had been 10 per cent. over the previous year, the number of the resident patients had doubled.

The following were yesterday elected life governors: Messrs. A. McDougall, John Patterson, F. D. Lawrence, W. I. Gear, Thomas O'Connell, J. J. Westgate, William Rutherford, Andrew Rutherford, William Morrison, Charles B. Esdaile, William Hanson, Mrs. Colin McArthur, and Drs. Howard M. Church and Richard Kerry.

The election of officers for the ensuing year resulted in last year's officers being re-elected, by acclamation, as follows: Honorary presidents, Messrs. Randolph Hersey and Clarence Smith; president, Mr. Peter Lyall; first vice-president, Mr. Robert Backerdike; second vice-president, Mr. J. C. Holden; treasurer, Mr. H. A. Hodgson; secretary, Dr. George T. Ross; committee of management: Messrs. P. W. McLagan, Alderman Gallery, W. H. Trenholme, T. J. Rutherford, Thomas Gilday, J. T. McCall, John Murphy, Dr. James Perrigo F. J. Hackett, J. Pitblado, C. W. Davis, Jas. A. Ogilvie, jr., Clarence F. Smith, J. A. Mathewson, and Charles M. Hart.

ROYAL VICTORIA HOSPITAL.

The annual meeting of the Royal Victoria Hospital was held January 19th, 1909.

The following officials were appointed for the ensuing year: Miss M. F. Hersey, lady superintendent of the training school for nurses. Dr. John McCrae, assistant physician to the hospital, Dr. F. Tooke, assistant opthalmologist.

The following appointments to the staff were made for the year ending the 31st: Associates in Medicine—Dr. H. B. Cushing, Dr. F. M.

Fry. Associate in Medicine—D. F. Burnett, in charge of dermatology. Associates in Medicine—Dr. C. K. Russell, Dr. G. D. Robins, in charge of neurology. Associate in Gynæcology—Dr. J. R. Goodall. Clinical Assistants in Medicine—Dr. W. W. Francis, Dr. D. W. McKechnie, Dr. J. Meakins, Dr. C. A. Moffatt. Clinical Assistants in Surgery—Dr. W. E. Nelson, Dr. F. C. McKenty, Dr. J. W. Hutchinson. Clinical Assistants in Oto-Laryngology—Dr. H. C. Muckleston, Dr. E. H. White, Dr. J. F. Rogers. Clinical Assistant in Opthalmology—Dr. A. G. McAuley. Assistant Pathologist—Dr. O. Klotz. Registrar in Pathology—Dr. J. McCrae. Assistant Bacteriologist—Dr. A. C. Rankin. Registrar—Dr. H. B. Cushing. Assistant Registrar—Dr. A. G. McAuley.

During the year 3,699 patients had been admitted, an increase of 301 from the previous year. There were 2,106 Protestants, 1,154 Roman Catholics, 387 Hebrews and 52 of other faiths 1,863 were free patients, 1,154 public ward patients, paying 50 cents and one dollar per day, and 735 private ward patients; 2,680 were residents of Montreal, and 1,019 came from districts outside of the city. The total days of hospital treatment aggregated 84,204, as against 81,902 during the previous year, an increase of 2,302 days, The average number of days' stay in hospital per patient was 22.9, as against 24.10 the previous year. On the 1st January, 1908, there were 218 patients in the hospital remaining from 1907, and during the year 3,688 were discharged, of whom 2,133 were well, 1,076 improved, 143 not improved, 125 not treated, and 211 died. Remaining in hospital 31st December, 1908, 229.

During the year the improvements of the pathological department had been carried out, thus completing the whole of the fireproofing of the hospital and the necessary additions to the buildings.

The mortality during the year was 211, of whom 68 expired within 48 hours after being taken to the hospital. The mortality rate for the year counting all patients was 6.07 per cent., while deducting patients who had died within 48 hours of admission, the deathrate was 4.11 per cent.

The highest number of patients in the hospital on any one day was 253, on October 2nd, and the lowest 196, on July 16th. The highest monthly average was 244 in October, while the lowest 211, occurred in July. The daily average for the year was 231, as compared with 224 for the previous year, an increase of 7 per day. In the out-patient department 4,756 patients were treated, their visits to the hospital aggregating 31,314. The hospital ambulance made 1,155 trips.

The income for the year amounted to $172,171.14, while the ordinary expenditure was $165,396.71. The balance of $6,774.14 was applied to the indebtedness for new buildings and other improvements.

The total cost per day per patient was 1.16. Of this 23¾ cents went to provisions, which was an increase of 3¼ cents over last year. The balance of 93 cents went for maintenance, including staff, servants, employee, etc.

Retrospect of Current Literature.

SURGERY.

UNDER THE CHARGE OF DRS. ARMSTRONG, BARLOW, ARCHIBALD, AND CAMPBELL.

E. Muller and A. Peiser. The Technic of the Antiferment Treatment of Suppurative Processes." *Beiträge Zur Klin. Chir.*, Oct., LX., Nos. 1-2, 1908.

In the *Münchener Medizinische Wochenschrift,* April 28, 1908, Müller and Peiser first described their method of treating suppurative processes by means of an antifermentative serum, pointing out at the same time that one of the factors in hyperemic treatment was the increase secured in the local supply of antiferment. Peiser obtained excellent results in the treatment of 100 cases with direct irrigation of pus cavities with fluids rich in antiferment, and demonstrated that all acute infections leading to abscess formation yielded to this method of treatment.

In the present paper the authors point out that the most suitable fluid for antiferment treatment is human blood serum;—also fluids obtained by puncture from the thoracic and abdominal cavities, and rendered bacteria free by filtration. Normal animal serum is not suitable. Where puncture fluids are not available, Müller and Peiser have used the serum of the individual, obtained by venous puncture and aspiration, it being necessary to secure one-half as much again of blood as the quantity of serum required. The serum may be separated from the blood either by beating with a sterilized stick and then filtering; by centrifugalizing; or, where not required for immediate use, by allowing it to separate from the clot at ice-chest temperature.

The cases most suitable for this form of treatment are:—

(1) *Abscesses.* In such cases the pus aspirated from the abscess cavity is replaced by an equal quantity of serum through the same needle. This is re-aspirated and the cavity again filled with fresh serum. The needle is then withdrawn. If the inflammatory signs persist, the above procedure is repeated in twenty-four hours. A third inoculation is said to be seldom called for.

(2) *Septic Ulcers.* In such cases dressings saturated with serum are applied daily until the discharge has disappeared.

Where the individual has recently suffered from an acute general infection, it is important to use a serum obtained from a healthy subject. In hospital practice the use of puncture fluids has been found very satisfactory. Sera rich in antiferment, taken under aseptic precautions, may be kept indefinitely at ice-chest temperature.

E. M. v. E.

MEDICINE.

UNDER THE CHARGE OF DRS. FINLEY, LAFLEUR, HAMILTON, AND HOWARD.

L. M. Warfield. "Arterio-sclerosis." St. Louis, 1908.

In his book Warfield defines the term, and describes anatomically the sels; points out the importance of the small arterioles; the effect that a shutting-off of one part of the circulation has on another part, provided the heart force remains the same.

He points out the strain in the aorta—50-100 cc. of blood 70 times a minute into an already filled aorta; the large vessels of the arch take much strain, but no large vessels come off after this till the diaphragm: thus the thoractic aorta is liable to be the seat of disease changes.

With regard to pulse tension, he says that ordinary arterio-sclerosis is not necessarily accompanied by high blood tension. When the latter exists, there is either renal disease, sclerosis in the splanchnic area or of the aorta above the diaphragm: High tension can occur (1) by stimulation of the constrictor centres and (2) by direct action on the muscle cells in the arterial walls. Adrenal secretion, and the secretion of chromaffin cells, probably do both.

In dealing with the radial artery, the author states that the changes are mainly medial; calcification in the media gives the "beaded" quality to the vessel, and such areas become bulged: thus, he says, a series of small aneurysms occurs.

Experimental arterio-sclerosis affects most the thoractic aorta, because the diaphragmatic opening acts as a kind of regulating flood gate—a point that is difficult to believe. The tortuosity of arteries is due to their lengthening, because of increased pressure when they are no longer capable of retracting after the pulse wave has passed.

In dealing with the etiology there is nothing new offered. As early signs of arterial change, the symptoms that mark "neurasthenia" in the young may in those over 45 mean arterial change. Epistaxis in the middle aged is sometimes a symptom: progressive emaciation may ensuet the dyspeptic symptoms of arterio-sclerosis are given some space; ocular changes are important. Arcus senilis means arterio-sclerosis, but arterio-sclerosis does not necessarily mean arcus senilis.

Under symptoms and signs he divides the classes into cardiac, renal, abdominal, cerebral, spinal and local. The first two are readily understandable: abdominal sclerosis as an entity—"angina abdominalis"—is that degree of sclerosis necessary to give hæmochromatic changes (brown atrophy), and fatty infiltration of the organs. A sense of oppression, weight or pressure, epigastric tenderness, pain after eating, vomiting and hæmatemesis may be present; or again, epigastric tenderness and dizziness with sweating after a meal (Perutz) have been described. With sclerotic abdominal vessels, thrombosis leading to necrosis may bring on an acute surgical ailment. Spinal sclerosis, he describes as an entity: weakness and easily induced fatigue of the legs, jerking, numbness, heaviness and even pain in the legs, progressive incontinence of urine and progressive paraplegia. In diagnosis, Warfield says the man who "gets up at 7, works all day, plays golf, drinks 3-6 whiskies and is proud of his physical development and has not seen a doctor in ten years" is the man whom an observant physician can sometimes warn in time.

Wm. Russell. "Arterial Hypertonus, Sclerosis and Blood Pressure." Edinburgh, 1908.

Russell points out the tone of the arteriole; also its "pulsatile movement" partly stimulated by nervous mechanism, partly mechanically by blood-flow: hypertonus is the contraction over a generalized area. He applies the term arterial-sclerosis to all thickened arteries, except to local thickenings occurring in endarteritis obliterans: this diffuse permanent thickening is clinically to be recognized as separate from atheroma.

One may consider that when the arteries are contracted, the actual pressure falls there and lower down; but is raised necessarily behind the affected area, unless there be a compensating relaxation elsewhere.

Hypertonus can be clinically distinguished. In a non-thickened artery, before middle life, if chronic kidney disease be absent and syphilis, and he adds, an alcoholic history, it may be assumed that the thickening is hypertonic. An ordinary sized or large vessel with a thick wall is usually structurally thickened; a small vessel with a thick wall is usually hypertonic.

In thickened vessels, hypertonus can still arise. Russell says recognition of this may be acquired. An artery which is lumpy and in which rings and patches can be felt may at times fail to give this impression; when it is so, it means that hypertonus is necessary to make these areas palpable.

As to the causes of hypertonus, he thinks the nervous influence has been over-emphasized; and lays great stress on the toxic materials cir-

culating in the blood. He bases this on the effects obtained experimentally from the use of chemicals. The contraction is a means of diminishing the supply of impure blood to the tissues.

Hypertonus is set up by "muscular excitants," and recurrence or continuance of it leads to hypertrophy of the muscular coat of the artery; this happens if the hypertonus be long continued and if the blood pressure be maintained: blood pressure maintenance depends on the left ventricle: thus thickened arteries appear in the young. "The physiological corner stone of my contention is that the vessels contract under the direct influence of irritating substances, which also act upon the intima." This hypertonus gives high "readings" on the Riva-Rocci instrument.

Relaxation of the vessels by drugs, etc., makes this lower; sometimes after relaxation the pressure is heightened, because the relaxation gives the heart greater freedom and therefore more vigor. But though the artery wall always enters into these readings, they are not valueless; with hard arteries the readings will keep high, but the variation will show the readings between which hypertonus is effective.

The causes of hypertonus exist most in the alimentary tract and result from proteid (putrefying) foods rather than from carbohydrates: "suppressed gout" is closely allied to this; constipation is thus an active agent and alcohol is also.

In connection with the old idea that the adrenal, being stimulated, gave out constrictor substances (referring to Dr. Rolleston's address here), Russell harks back to an old idea: "Is the cortical part of the adrenal meant to destroy or transform the nedullary substances?" That is, does the medulla extract harmful substances from the blood, and are these neutralized in passing through the cortex? With strain of overwork, the adrenal might then allow constrictor substances to accumulate in the blood.

To return to hypertonus, it is highly necessary to recognize it, not that one may "lash the heart with tonics," but that one may restore a lower aortic pressure by relaxing the hypertonus of the arterioles.

He takes hypertonic spasm as the cause of angina pectoris; also the cerebral arteries are liable to it, because the cerebral, coronary and pulmonary vessels are not linked with the vaso-motor centre.

Such cerebral symptoms vary from slight numbness to hemiplegia and aphasia; and the suggestion is here put forward: Is not the pitutitary to the cerebral what the adrenal is to the general circulation?

GUBB. "Arterio-sclerosis." *Lancet*, July 11th, 1908.

Gubb details some of the premonitory signs of arterio-sclerosis, such as migraine, epistaxis, alopecia, diminished energy and power of concentration, psychical depression, irritability, neuralgia, tingling, numbness and paresis. He points out that the "stability" of the pulse is useful; *i.e.*, the pulse is 8 or 10 more in the erect than the recumbent posture; should this difference fail, the assumption of arterio-sclerosis is a safe one, and if it be reversed, *i.e.*, the standing pulse be less than the recumbent one, it indicates actual organic disease (regurgitation?). The writer somewhat favours Russell's view that the hypertension of the early stages may be dependent on the spasm of the arteries.

He notes that high arterial tension, if united with renal disease, may be the cause directly of arterio-sclerosis.

LANCEREAUX. *Bull. de l'Acad. de Méd.*, June 2, 1908.

Lancereaux says arterio-sclerosis is often a disease of those between 30 and 40 years of age. Gout and lead are strong causative factors; eating, drinking and smoking are only good assistants to these. Gouty people should seek prophylactic treatment early, even if their only claim to gout be the pedigree. Lancereaux's favorite method of treatment is pot. iod. (grs. 15 to 45) per diem, through years, three weeks in the month with purgatives to promote iodine excretion. Baths, rubs, douches, etc., assist elimination.

STENZEL, A. *Amer. Jour. Med. Sc.*, February, 1908.

Stenzel's paper is devoted to an appeal not to consider all the associated conditions which appear in arterio-sclerosis as the result of it. Often they are merely senile.

WALTON AND PAUL. *Jour. A. M. A.*, January 18th, 1908.

These authors think that arterio-sclerosis produces apoplectiform attacks, vertigo, loss of memory, etc., *but not headache*. Does it cause "elderly" neurasthenia? The hypertrophied heart they think dependent on renal degeneration, and arterio-sclerosis without these two is not usually accompanied by high blood pressure. If either of these is present with arterio-sclerosis, there will be moderate tension; if both, high.

THAYER AND FABYAN. *A. J. Med. Sc.*, December, 1907.

A thickened radial in the old is normal: in the middle aged or young, it means either that the vessel has had excessive strain or by inherent weakness, it has had to fortify itself against normal work. The mesenteric artery and the aorta generally show similar changes.

F. P. Henry. *Month. Cyclop. and Med. Bulletin*, June, 1908.

Arterio-sclerosis is not a disease *per se* of age; there are many toxins which may cause hypertension. Is hypertension itself a cause? In favour of this view (1) adrenalin causes experimental arterio-sclerosis; (2) In arterio-sclerosis, the adrenal is often hypertrophied; (3) The removal of the thyroid and ovary, depressive organs, allows arterio-sclerosis. Regarding the first of these, Waterman (Virchow's Archiv., Feb., 1908), found that when hypertension was prevented by the simultaneous use of amyl nitrite, the adrenalin caused arterio-sclerosis all the same. Josué considers that hypertension is not necessary to arterio-sclerosis, but its presence is a valuable corroborative sign. J. McC.

OTOLOGY.

UNDER THE CHARGE OF DR. BIRKETT.

An examination into the condition of the vestibular apparatus in a series of cases of deafness of non-suppurative origin. Norman H. Pike, M.B., B.S., London. Journal of Laryngology, Rhinology and Otology. November, 1908.

The total number of cases examined was seventy-four, all of which were suffering from a high degree of deafness in one or both ears. The examination of each case was conducted after the method of Barany, of stimulating the vestibular apparatus, and observing the resulting nystagmus.

The turning and caloric tests were employed to elicit the nystagmus.

The subjective symptoms, such as vertigo, nausea or vomiting, seemed to depend more on the temperament of the individual than the condition of the vestibular, for vertigo was noticed when the vestibular irritability was normal, increased and diminished. Where, however, one, or both, vestibular apparatuses did not functionate there was no disturbance of equilibrium. Two classes of cases, viz., brain tumour and congenital syphilis are deserving of special notice. In all ten cases of brain tumour the vestibular irritability was diminished on the same side as the tumour. The importance of these findings lies in the application of Barany's test as a further aid in the localization of brain tumour.

All the cases of congenital syphilis, seven in number, showed a diminished, or absent, irritability of the vestibule. That there was in congenital lues "such a constant obliteration of the labyrinth was up till now not known."

In the total seventy-four cases of non-suppurative deafness that were examined, the vestibular irritability was normal, or increased, in thirty-nine, and impaired or not functioning in thirty-five. J. T. R.

PATHOLOGY.[1]

UNDER THE CHARGE OF DRS. ADAMI, KLOTZ, DUVAL, AND NICHOLLS.

Report of the Imperial Cancer Research Fund, 1908.—E. F. Bashford, Supt. of Research Laboratories.

This is the third report which has been issued by the British Cancer Commission. As the second report appeared in 1905, a great deal of material has accumulated to make up the third report.

The ethnological data concerning the distribution of cancer, the zoological distribution of cancer, the study of spontaneous mouse cancer, and the minuter histological structure of cancers and sarcomas, are all discussed at length in separate papers by the investigators who have devoted years of study to the subject. There are seventeen papers in all.

In the introduction Bashford says that "much of the pessimism with which the future of the investigation of cancer is still regarded, is due to the persistence of the widely disseminated but ill defined idea that malignant new growths, as a whole, are of congenital origin." The study of the incidence of cancer as determined by irritants in man, demonstrates absolutely that the generalization of the idea of a congenital or embryonic origin is incorrect, and this conclusion agrees with the results of experiments, and notably with the experimental production of sarcoma.

Ethnological distribution of Cancer. Bashford.—The author finds that very little reliance can be placed on the vital statistics of various countries. This discredit which must be placed upon the figures of the incidence of cancer, is dependent upon the improper methods of death registration. In France, Denmark, Sweden and Bulgaria, the causes of death are not tabulated except for the towns. The number of deaths assigned to cancer increases in one country or another, in a manner parallel with the increasing accuracy of the vital statistics, and the low death rates in Servia, Hungary and Spain are probably the result of understatement. Switzerland shows the largest number of deaths due to cancer, which may be the result of the customary medical diagnosis of the dead bodies. The death rate from cancer in England is 0.79 per 1,000 population. These figures, Bashford believes, are nearer the truth than in most countries. Some Governments permit lay-men or lay-women to register the diagnosis of death, which is apt to lead to cases such as cited by Prinzig. In one an ignorant peasant was authorized to certify the causes of death, all of which he reported due to cardiac failure; while another returned fifty deaths from diphtheria in Filesi, at a time when that disease was quite rare.

Still more are the reports of cancer among the savage races to be discredited. The assertion that cancer is a disease peculiar to Europeans, and when occurring in the natives of other parts of the globe is due to a communication of the disease to them, is without foundation. When a definite search is made among the savages, cancer of various parts of the body is noted among them. There is, however, this peculiarity that certain races have cancer in certain regions of the body more commonly than others. Thus the Irishman with his short pipe has cancer of the lip, and in Egypt where Bilharzia infection of the bladder is frequent, there too is cancer of this organ quite common. Natives of Kashmir, who wear small earthenware pots with charcoal fire, about their waists, are commonly affected with epithelioma of the abdominal wall, resulting from frequent Kangri burns. Cancer of the mouth is frequent in India among the natives who chew a mixture of betel nut, tobacco and slaked lime, and in Ceylon more than half of the recorded cases of cancer are of the mouth and lips. The frequency of cancer of the penis is apparently associated with chronic irritation, due to the accumulation of dirt and secretion under the prepuce, and it is practically unknown in the Mohammedan races who practice circumcision.

Again, although cancer in civilized countries seems to be on the increase, this is probably only apparent from the improved records. Diagnoses are made with much greater accuracy to-day, and the methods of precise registration of death have been much improved.

In short, all races are affected with malignant growths; the sites of these growths vary, however, among different races, dependent upon certain race or individual customs.

These conclusions are borne out by the report of Dr. Seligmann, who notes that tumors both benign and malignant are to be found (although infrequently) among the Melanesians and inhabitants of New Guinea.

Zoological distribution of Cancer.—Evidence is rapidly accumulating that malignant new growths occur in all vertebrates, from mammals to fishes. Although the frequency of the occurrence appears to be on the increase, this is to be attributed to the closer observations that are made. Sarcomata are known to occur in the following mammals, jackal, bear, lioness, tigress and dog, while cancers have been found in jackal, opossum, lioness, rabbit, cow, cat, sheep and others.

Cancers and sarcomata too, are reported in birds, the most frequent site being the intestinal canal. Likewise tumors of various kinds are found in reptiles and amphibians. Quite a number of skin cancers have been reported in frogs, but these have shown the peculiarity of not producing metastases.

Over 2,000 cases of cancer of the thyroid in fishes have been collected by Murray. Although cancer is universal in vertebrate animals escaping the effects of many chronic forms of irritation affecting man, its occurrence is frequently associated with other external irritants and it may not merely be the ease with which lesions on the surface are observed, which has led to the accumulation of our knowledge of the skin cancers. As in man, so in animals, no one form of external agency is constantly associated with cancer. The fundamental common factor is the peculiarity of the living cell to exhibit malignant growth under the action of the most diverse agencies in different forms of life. The wide zoological distribution of malignant growths, while affording the completest answer to the myriad speculations on the etiological association of conditions peculiar to mankind with the incidence of cancer, cannot be expected to furnish other than the most general indications of the essential factors in its development.

Among the tumors of animals which afford special interest are the cancers of mice and rats which lend themselves so well for experimental purposes. Some thousands of these mice cancers have been observed and studied, and it is found that the laws governing their growth and effects are comparable to those found in man. Considerable criticism has opposed the study of spontaneous tumors in animals. These, such as the denial of metastases of Jensen's mammary mouse cancer, are no longer possible. It has been shown that the inoculated tumors do give metastases when observed for a sufficient length of time.

Experimental Cancer Studies.—The mammary cancers of the mouse have served the greatest usefulness for the study of experimental transplantation. Aside from these cancers various other malignant and benign tumors have been observed in the mouse. Inoculation experiments are usually made into the abdominal wall and into the peritoneal cavity. Besides the local development of the cancer, metastases develop most commonly in the lungs but also in the glands and other organs. The lung metastases apparently develop from cells transferred by way of the blood stream.

Comparable to the human mammary cancer the matrix of the tumor may undergo various changes. In some instances a sarcomatous tissue replaces the usual connective tissue stroma, while again in other instances the matrix develops a framework of bone or cartilage. In one instance Murray observed the development of 142 spontaneous tumors in the same animal.

In some instances a metaplasia is noted in the mouse cancers. Tumors of a purely adenomatous character may develop squamous-celled cancers,

and the reverse has also been noted. Such tumors which have taken on new characters, may entirely lose their former type and be entirely replaced by the modified growth.

The course of spontaneous tumors is usually progressive, although spontaneous absorption occasionally takes place. Observations were made on the course of all the tumors and charts indicating the increase or decrease of the primary growths, and the occurrence of secondaries were prepared.

In transplanting tumors to new animals, small bits of tumor are obtained from the living infected animals and inserted into the peritoneum or under the skin of the new host. The percentage of successful transplants varies greatly with the tumor to be transplanted and with the new host. Ehrlich explained the unsuccessful transplants, in assuming that these tumors possessed a lower avidity for the foodstuffs than did the normal tissues. There are others who refer the cancerous proliferation to a disturbance of the intracellular equilibrium, the cells being unable to remain in a resting stage. However, the cancerous proliferation cannot be considered alone, without taking into account the individual resistance presented by the other tissues of the animal.

Gierke has demonstrated very well how a certain tumor will often retain its characters through many generations, and how, on the other hand, its structure becomes much modified by transplantation. The hæmorrhagic mammary cancer of the mouse may take on an adenomatous appearance, retaining, however, its malignant characters of destruction and metastases. He points out that the histological characters of a tumor may not represent its biological characters of malignancy. Tumor tissue often becomes modified in its appearance by the stroma into which it is implanted. It is found that the sites of an unsuccessful primary inoculation offer greater resistance to subsequent implantations. This he believes may be due to the "stroma-reaction." There may be some relation between this stroma-reaction and scirrhus cancers.

Gierke's results on immunizing mice against cancer agree with those of Ehrlich. It is found that animals treated with a primary dose of cancer material, resist to a considerable extent the transplantation of the same tumor, and have also developed an immunity, although less, against tumors from other sources.

On the other hand, Gierke found that mice which had been successfully infected with a tumor were more susceptible to a reinoculation of that tumor than normal mice. This finding is opposed to the views of Ehrlich. It not infrequently happened that the second tumor implanted grew much more rapidly than the first one.

Bowen undertook a series of experiments to test the effect of interfering with the blood supply on the growth of tumors. His results are what one would expect. Complete obliteration of the blood supply is in many cases impossible, with the result that temporary regression of the tumor and later recurrence of the growth results.

Considerable has appeared in the literature of the occurrence of cancer and sarcoma in the same tumor; and further, Apolant and others have reported this development in their experimental animals. A very complete study of this subject has been made by Haaland in Bashford's laboratory. He has observed the development of a sarcomatous stroma in a transplanted cancer in nine cases. To all appearances (microscopically), the original tumor was of a pure cancerous type, having the usual connective tissue stroma. When such a tumor is transplanted there are degenerative changes and there is some loss of the connective tissue elements of the stroma of the cancer. These cells are replaced by the fibroblasts and invading blood vessels of the host, so that in part at least the stroma of the next transplant contains some of the elements of the second host. In the early stages of the transplant the tissues are very cellular, and it is difficult to determine with accuracy just at what stage the malignant features in the connective tissue were developed. In the later stages the sarcomatous interstitial tissue has overgrown the cancerous elements, and has little resemblance to the connective tissue stroma of the original tumor.

Some question has arisen whether these sarcoma-like tumors are true malignant growths, and not merely granulation tissue. The proof of this lies in the development of metastases in various organs, and in the destructive invasion of all the tumors.

In the development of the sarcomatous stroma, some difficulty arises in distinguishing the cancer cells from the neighboring sarcoma elements. Apolant has also spoken of this recently, and even hints at the possible origin of the sarcoma cells from the epithelial tumor. Haaland denies any association in the origin of the sarcomatous elements with the previously malignant epithelial cells.

This author is rather inclined to believe that the irritation and altered conditions brought to bear on the stroma of the cancerous tissue by the repeated transplantation, has enhanced the power of regeneration and proliferation of the connective tissue stroma, leading to the development of sarcomata.

General Results of Propagation of Malignant New Growths. — The general results of the work on experimental cancer have been summarized by Bashford, Murray, Haaland and Bowen. It may be said at the

beginning that the experimental reproduction of the lesions of cancer in sound animals occurs only under such conditions, rendering it highly improbable that the disease is usually or even occasionally communicated from one living being to another.

There are many difficulties attending upon the success of experimental transplantation of tumor tissue. The race of mice, age of the animals, method of introducing the tissue and mode of collection are important factors requiring attention in performing the experiments. In primary transplants there are only about 10 per cent. of "takes." It is an interesting observation that the tumors of mice of one country are not readily transplanted to those of another. When, however, a tumor has been successfully propagated in a new race of mice, the tumor tissue adapts itself to the new hosts and the proportion of successful transplants increases.

It is an interesting fact that with the adaptation of the tumor tissue to the host the virulency,—or, more properly speaking, the successes attending transplantation increase rapidly. Thus, in a propagated tumor, whereas the first transplant gave only 15 per cent. of takes, after nine generations the percentage steadily rose to 84. It is, therefore, apparent that cancer cells follow the same laws governing all living cells, that they may adapt themselves to their environment and then proliferate without hindrance in their new surroundings.

Induced Resistance in Mice against Cancer.—In 1901 Jensen observed the complete disappearance of tumors from mice that had been inoculated successfully, but he reported that the results of attempts to cure mice of tumors had hitherto been uncertain.

Bashford's school pointed out the great care which must be taken in attributing unsuccessful tumor transplantations to an immunity possessed by the animal. There are so many factors necessary for the uniform success of transplanting neoplasms in mice, that until such an experimental technique is acquired which will give 85 to 100 per cent. of success, the conclusions drawn from such experience would be fallacious.

Aside from the technique of transplantation, the growth of tumor cells is dependent upon two factors, firstly the inherent growing activity of the cell, and secondly the resistance of the tissue in which the cells are proliferating. When the energy of growth of the tumor cells is great, the resistance of the surrounding tissue becomes of small importance, but the reverse is true when the tumor cells are of low growing powers.

In order to obtain comparable results attention must be paid to (1)

dose of the tumor material, (2) the age of the animals, and (3) the site of inoculation. Young mice are considerably more susceptible than old ones, and are used in preference. It is also better to use the smallest doses of the tumor emulsion which will give a constant high percentage of successes.

It has been found that the ventral regions gives better results for cancer transplantation than the dorsal. The explanation is offered, that the connective tissue reaction in the mammary region is more marked and more favourable for the propagation of the tumor cells.

It is an important observation that animals in which tumors have developed, and have then been absorbed, are highly refractory to further inoculation. This fact has been repeatedly demonstrated. It is also of importance that the animals in which tumors have disappeared after exposure to radium are just as refractory as those in which absorption took place spontaneously.

It has also been shown that the inoculation and absorption of tumor tissue in animals leads to a low grade of protection, so that small amounts of tumor inoculated into animals, will protect them so that subsequent transplants of the same tumor will give fewer successes than normal animals. The same mild type of protection is also induced by the inoculation of normal tissues.

Russel has undertaken a very complete histological study of the changes taking place in the introduced cancerous tissue in cases of normal and immune animals. He has followed the proliferative processes which occur on the one hand and the degenerative changes occurring on the other. There are a number of points which are very interesting. In successful transplantations there is a progressive degeneration of the stroma of the introduced tumor tissue, while there is a concurrent development of fibroblasts and new capillaries on the part of the host. This newly developing tissue becomes the stroma of the transplanted tumor and is essential for its development. In immune animals there is an entire absence of this stroma reaction, and the introduced tumor mass remains devoid of a supporting framework and of capillaries. In consequence a process of slow aseptic necrosis of the tumor results.

Russel is of the opinion that the immune animal possesses qualities in its serum which rob the cancer cells of a chemiotactic property of attracting a vascular stroma to it.

It is pointed out by these observers that the word "immunity" as applied to cancer-work must not be interpreted in the same sense as is used for micro-organisms. Cancer immunity refers more directly to a

diminished number of successes, distributed over a large number of animals. No serum has been obtained which shows any protective or curative influence over experimental cancer.

The numbers of experimental inoculations which have been made in mice have exceeded many thousands, and although none of the results obtained are directly applicable to man, yet our knowledge concerning the nature and development of cancer has been greatly enhanced.

O. K.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The fifth regular meeting of the Society was held Friday evening, December 4th, 1908, Dr. J. Alex Hutchison, President, in the chair.

DOUBLE SYMES AMPUTATION.

E. W. Archibald, M.D., presented this case before the Society.

I bring this case before the Society merely to show the result of a double Syme's amputation at the ankle joint. This patient was referred to me by Dr. Howell last April. On March 11th both his feet had been frozen and he came into hospital on April 11th. At this date the whole anterior half of each foot was in a state of dry gangrene, and there was also a large circular area of gangrene over each heel. The problem here was whether one could save half the foot by the Chopart operation, covering the ends of the bones and the heels with Krause skin flaps later on, or whether one should go above this line and cut away at the ankle joint by the Syme's or Pirogoff operation; or again whether one should go still higher and amputate at the junction of the middle and lower third the old "point of election." The man himself was opposed to any long stay in the hospital; and my own impression, in which Dr. Bell in consultation coincided, was that the Chopart amputation was more likely to give a poorer result than the Syme's, and in the second place we believed this would give a better result than with the older method of the higher amputation. The Syme's amputation was done. On account of the area of gangrene over both heels the ordinary posterior heel flap could not be used and was substituted by an anterior one taken from the dorsum. This man is a machinist and made his artificial feet himself at a total cost for the two feet of $4. (The mechanism was here demonstrated.) As is seen, the patient walks without limp, and with a reasonably firm step. He can walk for several

hours without fatigue. He can step up on a chair and down from it without danger of falling. In a general way he is able to do his work about as well as before the amputation.

INTUSSUSCEPTION IN INFANTS.

J. M. Elder, M.D., read the paper of the evening.

James Bell, M.D.—Dr. Elder is to be congratulated on his success in this class of cases. It is a subject which interests every surgeon, especially those who have to deal with children. A tentative diagnosis should be easily made. What impresses me is that Dr. Elder has been able to reduce the intussusception in three successive cases; that is I think excessive good fortune. In a large proportion of the cases which I have had to deal with I have been unable to reduce it at all. With regard to the treatment which used to be recommended as palliative, inversion, inflation and distension of the bowel, I cannot help thinking that it is of very little use, not always safe, and always dangerous from the delay which it necessitates. The difficulty I have had in reducing these intussusceptions with the bowel actually in my hands has led me to think what the effect would have been had the child been inverted and water or air or shot or some other material forced into the bowel. I cannot think it would have had the slightest effect for good. I do think that many cases are reduced spontaneously, but there is no doubt at all that early operation is the saving of the baby; there is no doubt that the time comes, when one waits, that the swelling, œdema and moulding of the parts makes reduction an impossibility. A great many of the cases I have had have been of that kind. In these cases what I have endeavored to do has been a resection after the Maunsell method. Withdrawing the incarcerated portion of the bowel through an incision, cutting it off and resecting. This can be done pretty rapidly and removes the gangrenous portion.

D. J. Evans, M.D.—Dr. Elder is also to be congratulated for having brought before us a surgical subject which appeals to every general practitioner. In the last fifteen years I have seen six or eight cases of intussusception. The vomiting in such cases has always impressed me as being rather peculiar and suggestive. It is more like an exaggerated hiccough, small quantities being brought up with each effort, and it is practically never projectile. This regurgition continues for some time, when there may be an interval of quiet, then another vomiting period.

The early diagnosis of this condition is so important that great attention should be paid to detail in making a study of the case. It is my habit to have the child practically stripped and placed upon the

table in preference to a bed, in a good light so that all the movements of the abdomen can be studied. It is impossible to satisfactorily examine the abdomen of an infant lying on a nurse's or a mother's knee.

In intussusception cases with the child stripped on the table the trained eye after watching the abdomen for a short time can frequently detect the site of the tumour; on palpating this area with gentle ballotting movements with two fingertips, its outline can be defined. This manœuvre must be carried out with extreme care so as to avoid straining or resistance on the part of the child. The tumour is usually of very definite sausage shape outline and rarely of great hardness.

If there is much resistance on the part of the abdominal wall an anæsthetic should be employed, when if a tumour is present it will rarely escape the fingers of the examiner.

I agree with Dr. Elder that palliative treatment by means of injections ought to be tried in every case before it is submitted to operation. I have had one experience in which I obtained a brilliant result from the early use of a high injection into the bowel. An infant nine months old was seized with pain and vomiting at mid-day and I saw it within one hour of the onset of the symptoms. A tumour could be palpated just above the umbilicus, running transversely across the abdomen. The symptoms were quite typical. A saline injection with the child in the inverted position caused the tumour to disappear inside of twenty minutes, when the child fell asleep. On waking two hours later there were two large bowel movements containing a quantity of blood and mucus. Dr. Shepherd saw the case with me and agreed that the symptoms were undoubtedly due to intussusception.

There is no question, I think, that repeated palpation and extended examination, associated with delay, results in the case going into the surgeon's hands with small chance of success following the operation. Careful, gentle examination by the method suggested, early diagnosis, high saline injections with the child inverted; which if unsuccessful should be followed immediately with laparotomy, performed as rapidly as possible and using but a small quantity of a general anæsthetic. Such a course would probably give a large proportion of successful cases.

The chronic cases of intussusception which usually occur in marantic infants suffering from diarrhœa are the most difficult to recognise. Fischl points out that the microscopical examination of the stools may be of assistance in making a diagnosis in these cases.

Where the case is one of chronic ileo-colitis there is usually in the stools a large quantity of bacteria, while the epithelial elements though present are not specially plentiful; whereas when intussusception has

occurred the epithelial elements are abundant, while the bacteria present are of a different type and are not specially numerous.

I have not had an opportunity to verify this observation of Fischl's, but mention it as offering assistance in so-called chronic intussusception.

F. R. England, M.D.—With Dr. Elder's permission I would like to ask Dr. Bell what his results have been in cases of intussusception where resection of the bowel had been found necessary. I reported before this society about twelve years ago a successful case of intussusception after operation. At that time the necessity of early diagnosis was emphasized and it was considered very exceptional indeed to get a recovery in a case which had been left so long as to make resection necessary. The success obtained in my case was due to early recognition and prompt operation. The case was of the ilio-cæcal variety, and the cæcum had passed around to the descending colon. The patient was an infant at the breast seven months old.

Dr. C. Gurd.—I would like to ask Dr. Elder if he noticed anything particular about the cry of the child. In two cases I had what impressed me was the severity of the cry; it gave one the impression of intense agony.

James Bell, M.D.—With regard to operation in these cases, my contention is that when one opens the abdomen in a case of late intussusception which cannot possibly be reduced, something must be done. The child is already in a very serious condition and as young children bear prolonged operations very badly, it is most important that operation should not be unnecessarily prolonged. The results in these late cases are very bad indeed albeit I cannot say anything at the moment about the statistics, either in general, or from my own experience. I think if we imagine ourselves, as we must all have found ourselves at some time, with the young child before us when the intussusception cannot be reduced and when it is necessary to secure relief to save the patient's life, we must conclude that if an artificial anus will effect the purpose, it is the best thing to do under the circumstances. But in most cases, resection will be necessary and may be very speedily carried out by Maunsell's method. This is generally necessary because the intussusceptum is probably gangrenous or if not, is likely to become gangrenous very soon and the production of an artificial anus does not relieve the whole condition.

J. M. Elder, M.D.—With regard to Dr. Bell's remark I may say that I considered myself fortunate in securing reduction in one or two of these cases; I pretty nearly gave it up in one case, but by persisting a little longer managed to reduce it. In late cases when you have a

large intussusception and serous adhesions have formed, it is no easy matter to get that out. I did not take up the question of the treatment of those cases which did not come out, but I agree with Dr. Bell that it is probably better to establish an artificial anus and do an anastomosis later. I think the method which recommends itself most to me is Barker's, in a case where one could not reduce the intussusception. This is simply a modification of Maunsell's method. An incision is made into the bowel tumour, and the invaginated portion is then pulled out through the incision, next pass sutures and cut away the intussuscepted portion. That occurs to me to be the method which would give the least amount of shock, and you are always sure of the two bowel ends meeting. Watson Cheyne lays great stress upon what he calls the combined method of reducing these intussusceptions. He does a laparotomy, gets out the bowel tumour, and then begins the high enema, It often took 15 to 20 minutes of pressure below to effect a reduction. He says you can succeed in this way where you cannot hope to do so by manipulation. I am very much interested in the palpation method which Dr. Evans has described, but I am sure one would have to learn to do it. Moreover you would have to be a specialist in order to be allowed to strip the child entirely. As to the peculiar cry mentioned by Dr. Gurd, I have heard that cry, and though it was not present in the cases I had, it is indicative of the agonal or acute cases. An agonizing cry is very typical of these cases, and if you get that condition in an infant there is no doubt but that it is intussusception. Here there is a peculiar pull upon the mesentery, which is very painful and continuous.

METASTIC GONORRHŒAL CONJUNCTIVITIS WITH CULTIVATION OF THE GONOCOCCUS.

Hanford McKee, M.D., read the report of this case.

M. Lauterman, M.D.—This society is indebted to Dr. McKee for the excellent work he has done in connection with these cases. The amount of work done is tremendous, personally I unfortunately would not have been able to do as much detail work as Dr. McKee has done in this individual case, and I fear that many of us would not have had the patience. I have seen a good number of cases of conjunctivitis that in the light of our former knowledge were difficult to explain, there being no evidence of direct infection, and until I was over in Vienna I was not aware that anyone had noted what was considered a systemic conjunctivitis due to the absorption of toxines or to the presence of gonococci in the blood.

It has been noted that such attacks of conjunctivitis usually came on after excessive sexual indulgence, and that these patients were as a rule men whose prostates or seminal vesicles or both, were infected, although in the majority of instances they presented no external signs of any latent disease.

The popular impression is that when the discharge ceases, the patient is cured, and I am sorry to say that this erroneous impression is not limited to the laity alone. These cases still harboring infection are allowed to go about, and later develop articular pains or other conditions which are the after results of this systemic infection. Two cases of periarthritis that I had showed no external evidence of disease, and yet a pure culture of gonococci was isolated from the joints.

I would like to ask Dr. McKee if he has had any experience with the anti-gonococcus serum manufactured by Parke, Davis & Co. I have used it in a series of twenty cases with fairly satisfactory results, one of these cases was characterized by the presence of a very marked conjunctivitis, and incidentally I could find no gonococci in the smear I made from the conjunctiva although on massaging the prostate gonococci were found in the secretion so expressed.

The most important point in this communication to my mind is that Dr. McKee has been able by careful work and application, to demonstrate the cause, possibly a remote one, but nevertheless with every necessary assurance, of this condition and if it does nothing more it should serve to impress us with the importance of carefully attending to every case of gonorrhœa that comes under our observation, in view of the far reaching effects that so often attend these cases.

TYPHOIDAL PERFORATIONS.

W. G. Rielly, M.D., F. R. England, M.D., A. G. Nicholls, M.D.—The patient, aged 26, was taken ill October 11th with a series of chills. Several days later she complained of more or less colicky abdominal pain, particularly so on the 18th. She was admitted to the Western Hospital October 19th, when, on examination, a diagnosis of typhoid fever was made. There was some diarrhœa, many rose spots, palpable spleen, and the blood gave a positive Widal reaction. The temperature ranged around 103⅖° for quite a few days, but nothing unusual was noted until November 3rd, when it was noted that the spleen was very tender on palpation. On November 4th and 5th she had two slight hæmorrhages for which calcum lactate and opium in small doses was given. She seemed to be doing well until November 9th, when she complained of severe pain along the course of the descending colon. By midnight

this had become very intense. The temperature had been gradually coming down for a week not more than 100° in the evening and dropping to 98⅗° towards morning. The pulse was 108, respirations 20. At noon November 10th the pain was very severe, the pulse suddenly rose to 140, although the general appearance of the patient did not suggest anything very serious.

Operation was advised, believing there had been a perforation, but permission was not obtained until well on in the afternoon.

F. R. England, M.D.—When I saw the patient she was very ill indeed, the pulse was small and rapid and could hardly be counted at the wrist. All the usual symptoms of peritonitis were present, pain, tenderness, and rigidity. The abdomen was opened by a median incision. A small amount of purulent fluid escaped on opening the peritoneal cavity. On passing the hand towards the right iliac region the finger tips passed through a large perforation in the cæcum directly into the bowel causing a large amount of fæcal matter to be poured out into the peritoneal cavity. Very extensive ulceration of the cæcum was found. The mucous membrane around the perforation was loosened and dissected away from the muscular coats, the whole cæcum seemed softened and the seat of extensive ulceration. The perforation was sutured after trimming the margins of the ulcer as well as several other points of ulceration in the neighbourhood where perforation threatened. The ilium was inspected and appeared to be in good condition. The patient's condition being desperate the peritoneal cavity was cleansed and the abdomen rapidly closed.

A. G. Nicholls, M.D.—The specimen speaks for itself. In making an examination of the body I found the usual signs of severe typhoid, with a certain amount of bronchitis and cloudy swelling of the glandular organs. The chief interest was in connection with the intestines A small quantity of thin fæcal matter was found in the right flank about the cæcum and also in the true pelvis; a small quantity of gas bubbled up through the fæcal matter. I removed the intestines carefully *en masse*. The usual site of the chief typhoidal ulceration is, of course, in the ileum. In this case, all I could detect in this situation was some depression of the Peyer's patches, but no sign of recent inflammation or ulceration at any point. I concluded from this that at some time or other there had been typhoidal inflammation, but that the patches had healed up, and I feel inclined to think that this had occurred weeks or even months before, because had not this been the case, one would have thought that some at least of the lower Peyer's patches would have manifested traces of acute inflammation. Practically the whole mucous

membrane of the cæcum was dissected off from the underlying muscle, and, on immersing it in water, it floated up in shreds on the surface quite away from the bowel wall. There was, about five inches from the ileocæcal valve, an area of ulceration which Dr. England had sewn up, and about one inch further down there was an ordinary pin-point opening from which exuded the gas I first noticed on opening the abdomen. The extraordinary part was the enormous ulceration of the mucosa. There were in one spot four or five ulcerations in which you could pass a probe quite easily from one to the other beneath the mucosa. On examining the large bowel more fully I found ten perforations in all; two near the ileocæcal valve; one about the splenic flexures of the colon; three about the middle of the descending colon; and four in the sigmoid. These perforations were enormously large, one being at least 1½ inches long. The question arose in my mind as to whether they could have occurred post mortem as a result of pressure within the bowel. It seems to me, however, that this could not be. At autopsy, there were no evidences of any great pressure within the bowel, further, the rent Dr. England sewed up was fully as large as those found subsequently, and finally, the occurrence of one such large perforation would suffice to lessen tension from gas. The extraordinary points in this case are the following: (1) The lesions were confined to the large bowel, a sufficiently rare thing in itself; (2) The great number of perforations; there were at least ten; and (3) Their enormous size.

J. M Elder, M.D.—I have had some little experience in operating upon typhoid perforations, but I have no experience whatever of perforation of the cæcum or colon. To my mind it is very disheartening to a surgeon to think that you can go in and attempt to close a typhoid perforation and find such a state of things. One point struck me was Dr. England's incision in the median line, I think the President will bear me out in saying that our practice has always been in favour of the appendix incision.

F. R. England, M.D.—I only wish to add to the clinical history that for at least ten days the patient had indefinite abdominal pains with some vomiting.

1.—EXCISION OF THE LARYNX AND PHARYNX FOR CARCINOMA.

2.—TOTAL EXCISION OF THE LOWER JAW AND FLOOR OF THE MOUTH FOR SARCOMA OF THE JAW.

James Bell, M.D.—

Case I.—Miss McA., aged 46, first suffered in March, 1908, from difficulty of swallowing and hoarseness. The hoarseness disappeared but

the difficulty in swallowing increased. She came to hospital on the 19th of October, 1908, and was operated upon the 21st of October.

Dr. Birkett found on examination the condition which had been described by Dr. Minnes of Ottawa who had sent her to me. There was an area of epithelioma at the upper end of the œsophagus and pharynx closely adherent to the lower part of the larynx.

In this case as in the other, the larynx, the upper portion of the œsophagus and the involved area of pharynx were removed in one mass from below upward without preliminary tracheotomy. The stump of the trachea was fixed to a skin wound just below the lower end of the vertical incision. In this case as the removal of pharyngeal tissues was not complete, I endeavoured to maintain a communication with the mouth cavity by connecting portions of the pharyngeal mucous membrane above and below.

This has been unsuccessful to a great extent and the patient has suffered a great deal more than she would have done had I not attempted so much.

In this case also the stump of the trachea seemed to come so readily into the skin wound which I had prepared for it that I did not divide the isthmus of the thyroid. I also sutured the stump of the trachea to the skin, contrary to my usual practice, with celluloid thread (Pagensticker) instead of silkworm gut. The result has been that infection took place in the lines of suture which cut through and the pressure of the thyroid caused some retraction of the stump of the trachea.

In all my previous cases I had been able to maintain the integrity of the stump of the trachea flush with the wound in the skin. In this case, however, there was some retraction and it will be necessary to wear a tracheotomy tube at least the greater part of the time.

It is still necessary to feed her by tube and it is doubtful whether she will ever be able to swallow very satisfactorily or not. In all other respects she is well and I have not much fear of recurrence.

Case II.—Mrs. S., aged 32, was admitted to the hospital on the 19th of October, transferred to the surgical side by Dr. Birkett later, and operated upon on October 31st.

She had suffered from soreness in the throat for four years. She had no other symptoms until last winter. Then she had tickling and a scratching feeling in the throat. She has had difficulty in swallowing since April and has not been able to take any solid food since. The larynx with the upper portion of the œsophagus and the large area of the pharynx were left as in the previous case. It was quite impossible,

however, to attach any portion of the pharyngeal mucous membrane. I therefore brought out the stump of the œsophagus just alongside the trachea but in a separate opening. She has had a very smooth convalescence and has suffered much less than the previous patient. She can feed herself quite satisfactorily through a tube introduced through the opening in the neck. There is of course no communication between the mouth cavity and the stomach. She is quite well and comfortable and I think has a reasonable prospect of immunity from recurrence.

Case III.—Mrs. J. P., aged 32, had a tumor of the lower jaw and a very remarkable history. She had small-pox at ten years of age, which was followed by a skin eruption which lasted six or seven months and some thickening of the jaw which has persisted ever since. In May, 1906, definite swelling first appeared in the submental region. In September, 1907, she had a considerable tumour beneath the chin which was opened and drained for some time and never disappeared. During the last few months, the tumour has grown rapidly and on the 30th of November, I removed the whole of the lower jaw from the angles forward together with the floor of the mouth and most of the skin down to the hyoid bone. I put a temporary support in the form of a piece of vulcanite into the space from which the bone had been removed and sutured the mucous membrane within the mouth. I was obliged to close the wound externally by dissecting up the skin and making lateral incisions. She has made an excellent recovery but I have no hope for an immunity as the disease was so far advanced. Dr. Keenan pronounces the growth to be a round celled sarcoma of very malignant type, probably engrafted upon myo-sarcoma—thus explaining, to some extent at least, the very extraordinary history.

Since February, 1898, I have removed the larynx in eleven cases. Seven of these operations were for intrinsic laryngeal cancer.

In four, the primary disease was in the pharynx and invaded the larynx secondarily.

Out of the eleven cases seven recovered: one of the seven however died on the 58th day from recurrence or rather extension along the carotid glands in the mediastinum.

Of the four deaths, three were from pneumonia, four, seven and fifteen days after operation respectively.

In one unfortunate case, in which the patient was suffering from complete obstruction in the œsophagus, I was unable to get below the disease and all I could do was to fix a tube into the œsophagus after operation. This woman died within a few days.

In the first four cases I did a preliminary tracheotomy and removed

the larynx from below. One of these died of pneumonia. In the last seven cases no preliminary tracheotomy was done and the mass was removed from below upwards. I consider this a much better method of operating than by operating after preliminary tracheotomy. In all cases operation was done with the patient in an exaggerated Trendelenburg position and the patients were kept with the foot of the bed elevated for days after operation. The intention here was to allow of the excretions gravitating upwards rather than gravitating downwards into the trachea and infecting the lungs. I am of the opinion that this attention to posture is important. In all cases the pharynx was closed and no attempt was made to prepare the patient for an artificial larynx.

In all the cases which survived, a satisfactory amount of whispering speech was developed. Case I. lived several years and died of recurrence in the lung. Case II, also lived several years and died of apoplexy. Case III. lived seven years and seven months and died of recurrence in the glands of the neck, about the base of the skull. Case VI, as already stated, died on the 58th day from recurrence in the glands of the neck. Case IX, was operated upon March last and the tenth and eleventh cases, are those which I present to you to-night.

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THE PATHOLOGY AND TREATMENT OF DIABETES MELLITUS, VIEWED BY THE LIGHT OF PRESENT-DAY KNOWLEDGE.

BY

F. W. PAVY, M.D., F.R.S.

The last of three lectures delivered before The Royal College of Physicians of London, 24th November, 1908, published under arrangement with the author.

[The first of Dr. Pavy's lectures deals with the normal disposal of carbohydrate in the body, with the arguments that may be brought against the so-called "glycogenic" theory, and with the mechanism associated with the passage of carbohydrate from its seat of absorption in the walls of the alimentary canal to that of utilization in the tissues. He points out that sugar does exist in the normal urine in proportion to the quantity in which it exists in the blood. The diabetic can handle carbohydrate up to the point of his tolerance and over this, the ingested carbohydrate is excreted as sugar, just as if so much sugar had been intravenously injected. Beyond the point of tolerance, carbohydrate must increase the sugar in the blood. The question of the function of the liver in safeguarding the circulation from sugar sufficient to cause glycosuria is discussed, and the negative view upheld. Incidentally there are some interesting figures upon the efficacy or otherwise of so-called "Diabetic foods."

The second lecture deals with the state in which food is conveyed in the circulatory system to the tissues, the author believing that the existing theories imply that the food material is carried in a form susceptible of excretion through the urine, and that such implication is untenable. The protein food molecule is broken down into fragments that can be at once re-synthesized into a reconstructed protein; this process probably occurs at the seat of absorption. The process is completed by lymphocyte autolysis, and the reconstructed protein reaches the blood through the thoracic duct. The digested material in blood plasma which has escaped

from the capillaries into the lymph spaces for tissue supply is also elaborated by the lymphocytes into available protein. The lymphocytes are ultimately autolysed into the proteins of the blood, this constituting the disappearance of the digestion lymphocytosis.]

LECTURE III.

I will now give attention to the sugar that may fail to be assimilated at the seat of absorption. There are grounds for considering that, in the absence of any large ingestion of carbohydrate food, it becomes mainly disposed of at the seat of absorption. What, however, escapes being here dealt with, passes to the liver, and becomes checked from further progress by being taken into the cells and converted into glycogen. Thus the liver constitutes a second line of defence against the flow of absorbed sugar into the systemic circulation, obviating the production of more or less glycosuria that would otherwise ensue if the sugar flowed on instead of being stopped.

There is nothing in the stoppage of sugar and its conversion into glycogen by the liver cells but what is comparable to the effect that is capable of being produced by the agency of the living cells of yeast. By intracellular enzyme agency, condensation or synthesis of the sugar molecules with the elimination of water is evoked in like manner as is known elsewhere to occur, and the product constitutes a store ready to be drawn upon as need may arise.

It does not fall within the scope of the matter in hand to enter into the question of the transformation of carbohydrate into fat, but it may be stated that doubtless the liver performs a steatogenic office. It now stands as an established point that carbohydrate may constitute a source of fat, and the *foie gras* derived from the goose may be taken as affording an allustration of the liver being capable of functioning in this direction. The point to claim consideration is to see how the storage of carbohydrate under the form of glycogen in the liver can be transported to the seat of utilisation in the tissues without passing as free sugar, and thereby being placed in a position to flow off with the urine. We learn from Bernard's puncture of the fourth ventricle, that if glycogen does actually escape from the liver in the form of sugar, the fact is revealed through the production of glycosuria, varying in intensity according to the amount present in the organ.

The glycogen of the liver constitutes simply a storage of carbohydrate derived from the food, and responds in amount to that of the sugar that may happen to be reaching the organ through the portal vein. There is nothing unintelligible connected with it. Its accumulation runs

strictly in a line with that occurring in unicellular organisms, for which yeast may be adduced as an illustration. It is open to common observation to find in living nature that redundant carbohydrate, wherever existing, is put for storage into a form like that of glycogen, starch, cellulose, etc., in which form it steadily remains till a demand for it arises, when enzyme action is brought into play, and it is broken down into suitably adapted molecules for appropriation to the purpose needed.

Glycogen is known to be a body of wide distribution in the various textures throughout the animal organism. Viewed in the manner represented, its origin is readily to be accounted for. Let it be supposed that carbohydrate is taken on by a biogenic molecular complex. If employed in the production of energy, it will be consumed and disappear. If not, and the supply of carbohydrate is kept up, it will be cleaved off and stored up under the form of glycogen.

The operation is analogous to what occurs in the case of fat. Fat similarly entering the molecular complex, if utilized will disappear, whilst if not utilized, may be thrown off and stored, accounting for the fat granules and globules discoverable in cells on microscopic examination. The term fatty degeneration is ordinarily applied to this condition, and it is viewed as pathological, but it is in truth representative of a widely occurring physiological operation. It is true, it may occur under circumstances where cell action has been interfered with by a damaged cell state. Here, certainly, it may be regarded as falling within the domain of pathology. Muscular growth in response to increased muscular work is truly a physiological phenomenon, but when the work which gives rise to the growth is of an abnormal nature, as, for instance, in the case of the heart under the influence of valvular disease or arterial sclerosis, the condition falls under the name of hypertrophy, and is regarded as pathological, although the line of action is the same. Thus, a line of action which may be claimed as pathological may be based upon a physiological operative procedure.

The gist of what I am endeavouring to urge is that it is within the protoplasmic molecular complex that the play of changes takes place which gives rise to the phenomena of life; that carbohydrate, fat, nitrogen-containing matter, and, in addition, oxygen enter this complex; that the inter-actions occurring are attended with energy production through the instrumentality of oxidation as a final result, and that when it happens that the oxidisable supply is taken on in excess of consumption by oxidation, it is cleaved off as storage material under the form of glycogen in the one case, and of fat in the other, and thus circumstanced, it is available for subsequent utilisation when demand for it may exist.

What is observed to occur in connexion with the leucocytes of the blood, and with muscular fibres, stands in illustration of the two kinds of cleavage spoken of.

Glycogen, then, is to be regarded as simply a reserve of carbohydrate material, ready, as in the case of fat reserve, to be drawn upon and utilized when it becomes wasted. Its special accumulation in the liver is to be accounted for by the position in which the organ stands in relation to food supply. The main purposes to which it becomes applied are bioplasmic growth and energy production. For the latter, the chief seat of utilization is in the muscles, and here the storage amount present is found to be in a great measure dependent on rate of usage. With limb muscles deprived of activity by nerve section or tendon division, observation has shown that a larger accumulation is met with than in the muscles of the other limb left intact. Conversely, observation has likewise shown that under exercise, as, for instance, when a muscle is tetanised, a decrease of glycogen takes place.

Külz showed by his experiments on previously well-fed dogs, that under very forced exercise, glycogen might be made almost completely to disappear from the muscles and liver in about 6 to 7 hours. As far as the muscles are concerned, the glycogen is lying close at hand and has simply to be taken by the bioplasmic material that uses it up. I consider it must be assumed that, as in the case of starch in the vegetable kingdom, the glycogen molecule requires to be broken down into sugar molecules before passing into the molecular complex in which consumption takes place, and it may be reasonably inferred that, in accord with what is commonly noticeable, there is concerted enzyme action set into play to bring about what is required.

With regard to the glycogen in the liver, which, as seen, equally disappears,, this is seated at a distance from where utilisation occurs, and the point now to be considered is how it becomes transported from one spot to the other and meanwhile escapes being placed in a position to show itself in the urine. We know when it happens, as after Bernard's puncture of the fourth ventricle, that the glycogen passes into the blood in the form of free sugar, the fact is revealed through the medium of the urine, but we have no disclosure recorded of any glycosuric effect having been produced by forced exercise, notwithstanding the short period within which the liver has been found to have become emptied of its glycogen.

The problem, then, now before us is how is the transport service carried on between the seat of glycogen accumulation in the liver and the seat of utilisation in the tissues, without leading to any show of its occurrence through the detectable appearance of sugar.

I have dealt with this matter in my "Carbohydrate Metabolism and Diabetes" (page 68), and have suggested that the transport is effected by the glycogen molecules becoming in the first instance broken down by enzyme action, just as occurs with starch molecules in the vegetable kingdom, into molecules of sugar, and then that these sugar molecules become linked on as side-chains to protein molecules, and thus conveyed in a locked-up, large molecular state to the tissues, where they become taken off accordingly as they are wanted.

This is nothing more than what happens in the ordinary course of chemical procedure. I have previously spoken about side-chains being taken on to a central ring or nucleus, and the capability of their being afterwards withdrawn without disruption of the nuclear body. The matter resolves itself into a question of the strength of affinity operating in one direction or the other. So it may be with sugar molecules linked on to a molecular blood complex. If they should be brought under the influence of a tissue complex in want of them, and thereby possessing a stronger affinity for them, it is only in the natural order of things that they should pass from the one to the other.

The train of phenomena would be that as the side-chains of the complex tissue molecules become worked off, they require to be replaced by fresh side-chains from the blood, and, in turn, the removal of these side-chains creates a demand which leads to the storage being drawn upon. Now, if the storage, as in the case of glycogen, is not of a nature to be adapted for shifting its position, it must of necessity be placed in a suitable condition for doing so. Here comes in the requirement for enzyme action, and it is suggested that as the storage is wanted, provision is made, through enzyme agency, for its supply in a form to meet what is needed.

Viewing matters in this way, the side-chain want in the blood leads to the storage glycogen being put into a suitable state to fill the void, and thus circumstanced, the carbohydrate becomes transported from the seat of accumulation in the liver to the seat of utilisation in the tissues without passing in a state to run off with the urine, as, in the free small molecular state of sugar, it would otherwise do in proportion to its extent of presence in the blood.

The idea here broached stands in conformity with the accepted view of what occurs in connexion with the transport of oxygen. Hæmoglobin is the agent concerned in the process. Taking on oxygen in the lungs, it travels as oxyhæmoglobin to the tisues, and gives up the oxygen that is needed to replace that which has been consumed in the bioplasmic molecules. Thus unloaded and made ready for recharging, the hæmo-

globin is conveyed back to the lungs, where a fresh intake of oxygen occurs. Thus the round is effected by the capacity possessed by hæmoglobin of taking oxygen into chemical union of a sufficiently feeble nature to permit of its being subsequently dissociated to meet the demand of the tissues. I urge that we have here a parallel of what occurs in the case of the transport of carbohydrate from the seat of accumulation in the liver to that of utilisation in the tissues.

In this transport of carbohydrate I have assumed that it passes in the form of a side-chain linked on to a large-moleculed constituent of the blood. As yet we have no distinct evidence before us to show what this constituent really is. Probably it is of a protein nature, and if so, we have material at hand to open out a consistent train of reasoning of much interest and importance standing at the root of what is being dealt with. Let me enter into particulars and expound what I refer to.

What is wanted for transport service is that the carbohydrate should be loosely linked on to the carrying molecule, so as to be susceptible of being disjoined without involving the disruption of the molecule itself. Evidence, as we shall see, is producible attesting the existence of such a state. At the same time, let me say that evidence is also producible having the effect of showing the existence of carbohydrate in another state in the molecule—in a state so closely locked-up as not to be susceptible of liberation apart from the disintegration of the molecule. Both points it will be found, have important practical bearings connected with them.

That the existence of carbohydrate in a loosely combined and in a firmly locked-up state in a molecule is no mere hypothesis is capable of being made manifest by what is seen when amygdalin is exposed to different kinds of enzyme action. A molecule of amygdalin has two molecules of carbohydrate within it. When subjected to the action of glucase, the ferment which transforms maltose into glucose, a molecule of glucose is split off without the production of any further effect, which means that the other molecule is left untouched. In contact with emulsin, however, both molecules are liberated, with benzoic aldehyde and hydrocyanic acid as associated products. The conclusion to be drawn from these results is that the two carbohydrate molecules within the amygdalin molecule are differently placed—that one is in a position to be easily detached without leading to other disturbance, whilst in the case of the other, its liberation involves molecular disruption as an attendant phenomenon.

A study of the effects of phloridzin affords immense help in unravelling the intricacies of the question that is being considered, and it

points in a very decisive manner to the existence of carbohydrate within the molecular complex, as a side-chain attachment on the one hand, and in a locked-up state in the nuclear centre on the other. It, moreover, goes further, and gives grounds for associating the side-chain attachment with transport service, leaving the locked-up portion as constituting a component incorporated during the construction of the molecule, whether in lymphocyte growth from food, or in bioplasmic growth elsewhere.

Phloridzin, as is well known is an active producer of glycosuria, and its action in this direction is exerted through the co-operation of the blood and the renal cells. The sugar does not, as in other forms of glycosuria, take origin elsewhere and travel to the kidney preparatory to elimination, but comes into view during the act of secretion of the urine, and in the absence of the kidneys phloridzin fails to produce any visible effect within the system. It is obvious, therefore, that some constituent of the blood other than sugar must be concerned in the production of the glycosuria. The output of sugar is sufficiently large and continues to show that there must be something to feed the blood to keep up the discharge occurring, and, coincidently with the outflow, it is noticed that a disappearance of storage glycogen occurs. Indeed, phloridzin supplies us with one of the most effective means of rapidly clearing away glycogen from the liver and the muscles.

That the blood is fed in the way suggested is supported by the evidence derivable from liver ablation experiments. It is possible for the life of an animal to be maintained for some hours after the removal of the liver and its associated viscera in the abdomen. In a paper published in the Journal of Physiology (Vol. XXIX, 1903), "On the Mechanism of Phloridzin Glycosuria" by Pavy, Brodie, and Siau, results are given which show that the sugar elimination declines after phloridzin injection at an infinitely greater rate in the liver ablation experiments than in control experiments where the viscera in question were left intact. It further appeared, when the sugar elimination had almost completely stopped, that a fresh start was given to it by transfusing into the vessels defibrinated blood derived from another animal.

Taking the fact that glycogen, as a result of phloridzin administration, disappears from its seats of accumulation, and that sugar contemporaneously shows itself in the urine, let us follow the matter on and see what the fact mentioned leads up to. The glycogen itself does not travel to the kidney and there constitute the source of the sugar that springs into view. As a first step in the operation occurring, it is not permissible to do otherwise than conceive that the glycogen molecules must be broken down into molecules of sugar. Now comes the import-

ant point bearing upon what next transpires. The condition is unassociated with hyperglycæmia, but hyperglycæmia should be present if the sugar molecules passed as such into the blood. It seems to me that we are driven to the conclusion that the sugar molecules must enter into combination with a constituent of the blood and then become set free again by the influence brought to bear when the kidney is reached. If a transport of sugar in one way or another occurs, as the evidence before us denotes it does, and it is not effected by passage in a free state, the only inference to be drawn is that the sugar is thrown out of sight by entering into a combined state.

Physiologists accept this explanation of the phenomenon of transport connected with phloridzin glycosuria. If admitted here, why should it not be equally admitted as applicable to what happens in connexion with the ordinary occurrences of life? Forced exercise leads to a rapid emptying of the liver of its glycogen, without producing any show of the passage of sugar through the circulation in a free state. If the sugar goes into combination in the one case, why should it not do so in the other? The circumstances stand in reality upon an analogous footing. The abstraction of carbohydrate from the blood to compensate for its consumption in the muscles during forced exercise, will create a demand for its replenishment, and thence lead to the store of glycogen in the liver being drawn upon. In the case of phloridzin glycosuria, the outflow of sugar that occurs in the kidney will, similarly to forced exercise, draw off carbohydrate and give rise to a demand for reinstatement from the glycogen store. The line of procedure is the same in the two cases, but the initial condition that leads to the demand for the replenishment of carbohydrate in the blood is different.

Support is given to the view that has been set forth by the modified conditions belonging to pancreatic glycosuria. Here hyperglycæmia precedes the glycosuria. The disappearance of glycogen occurs just as in phloridzin glycosuria, but the source of disappearance is conversion into sugar at the seat of storage. The kidney simply eliminates the sugar that is conveyed to it in the blood, and if the elimination is prevented by extirpation of the kidneys, the sugar goes on increasing, with the result of exceedingly high percentages having been noticed. The abnormality proceeds from a local transformation of glycogen into sugar, which recognisably passes into the blood in a free state, and subsequently flows off with the urine.

The instance that has been cited in reality shows what occurs when sugar from vanishing glycogen reaches the blood in a free state. In phloridzin glycosuria, there is equally a disappearance of glycogen, but

nothing is seen, as far as the blood is concerned, of the sugar derivable from it. Proof is given that the sugar has not undergone destruction by the fact of its coming into view when the kidney is reached. It is simply for the time being concealed by entering, as may be legitimately assumed it does, into combination with a constituent of the blood. If, in the presence of these circumstances, things can run on in this way, is it not permissible to assume that sugar may be transported in a locked-up state from the intestinal seat of food absorption, and from that of glycogen storage, to where it is required for service? By admitting this, all difficulties at once disappear.

I have previously referred to Professor MacLeod's article in Leonard Hill's "Recent Advances in Physiology and Bio-Chemistry" and criticised the grounds upon which he has sought to maintain the validity of the glycogenic doctrine. Although, in dealing with this point, he contends that there is a functional transit of sugar through the circulation in a free state, he falls in with the view of transit in a combined state, declaring in the first place (page 319) "there is reason to believe that a loose chemical compound—of a colloidal nature—exists between serum globulin and dextrose;" next remarking (page 363) that the mother substance of the sugar eliminated in phloridzin glycosuria is undoubtedly the serum proteid; and then saying (page 364) that the proteid which has been thus deprived of its sugar "becomes recombined with more of it during its circulation through the rest of the body." This, it will be seen, precisely represents what is claimed as constituting the physiological mode of transit.

There are further facts connected with phloridzin glycosuria that give support to the view that has been expressed. If repeated administrations of phloridzin are employed in a well-fed animal, continued elimination of sugar occurs without any material alteration of the associated nitrogen elimination. The carbohydrate of the food in the first part of its onward march after absorption, follows the normal course, but afterwards, through the agency of what occurs in the kidney, becomes diverted into a wrong direction and flows off with the urine as sugar. This is what happens whilst there is food supply or a glycogen reserve to be drawn upon, and the circumstances are compatible with the carbohydrate being linked on as a side-chain to a blood-contained molecular complex.

With the absence of food, and when the glycogen has been swept away from its seats of storage, the position of things with regard to the relative elimination of sugar and nitrogen becomes altered. The sugar falls until it arrives at a fixed relationship to the nitrogen, and when

this point is reached, it is assumable that both sugar and nitrogen are being derived from the breaking down of the molecular nuclear centre that was constructed at the time of the building up of the protein molecule. Evidently, in the one case, the carbohydrate is liberated without the destruction of the molecule, and in the other, the liberation is an accompaniment of molecular disintegration.

I have just spoken of the elimination of sugar in phloridzin glycosuria being connected with food supply. The carbohydrate in the food runs off as sugar in the urine, and it does this without showing itself as sugar in the blood. The only deduction that can be drawn from this occurrence is that it passes in a state of combination, and, in view of the intensity of the glycosuria that is sometimes observed, it is evident that the capacity for transit in this state must be very great. In pancreatic diabetes, the eliminated sugar is similarly connected with food supply, but the carbohydrate of the food reaches the circulation, and passes through it to the kidney in the form of free sugar. Thus, in both these conditions, the food carbohydrate passes through the system and makes its appearance in the urine as sugar. In connection with the one, it passes through in a concealed (combined) state, as I contend happens in its conveyance in the healthy person to the tissues for utilisation. In connexion with the other, it passes through in a free or uncombined (unassimilated) state, just as it does in ordinary diabetes. Herein, then, it may be considered that we have the two modes of transit, that in health and that in diabetes, represented.

I must not allow the subjoined remarks by Professor Halliburton, in his advocacy of the glycogenic doctrine, contained in the article that has been already referred to on "Diabetes Mellitus from the Physiological Standpoint" inserted in the July number of the "Practitioner," 1907, to pass without comment. At the present stage a fitting place is offered for referring to them, and I will proceed to avail myself of it. The question of the sugar formation by the liver is being spoken of, and the following line of reasoning is set forth. "At the present day, the prevalent opinion among physiologists is of the nature of a compromise between the two extreme views. The liver is, no doubt, able to convert part of its glycogen into fat, but most of its glycogen is regarded as leaving the liver as sugar (dextrose). In coming to the latter conclusion, physiologists are influenced by what they learn from surviving organs generally. An excised organ is undoubtedly on the road to death, but while it still retains vitality, the phenomena it exhibits are similar in kind to, through they may be different in degree from, those which it exhibits during life. It is impossible to suppose that, at a

given moment, arbitrarily called death, an organ can turn round and do what it never did before. Even in the case of blood-coagulation, which appears to be a direct instance to the contrary, there is no doubt, from recent research, that the blood is always tending to clot even during life, and is prevented from doing so by the production of anti-substances (anti-thrombin produced in the liver), which neutralise the activity of the thrombin or fibrin ferment."

It is a matter of surprise to me to find that Professor Halliburton has written in this way in the face of what is contained in my work on "Carbohydrate Metabolism and Diabetes," a presentation copy of which was forwarded to him. At page 68, the text runs: "the suggestion presents itself that sugar is taken on as a side-chain by a proteid constituent of the blood and transported to the tissues, where it is taken off for subjection to utilisation. The suggested operation is identical with what occurs in connexion with the transport of oxygen. Oxygen is taken on by hæmoglobin, and, in a state of combination, transported to the tissues, where it is taken off and applied to utilisation. Glycogen is a storage material consisting of very large molecules and therefore not adapted for shifting its position. I should think that the first action that occurs is the breaking down of its molecule into molecules of glucose, which become instantly taken on by the alluded-to molecules of the blood. There may be concerted action between the breaking-down and taking-on processes, and that there is such in operation is rendered probable by the fact that there is no show of sugar in connexion with the occurrence. Enzyme action, it may be considered, of necessity constitutes a part of the process, and the enzyme concerned, and set in motion as needed, may, in the presence of altered conditions, be intelligibly conceived to be capable of producing the deviation from the natural living state with respect to sugar that so quickly takes place as a post-mortem occurrence in the liver."

On the following page, in speaking of the effect of phloridzin, the statement is to be found: "The first effect of the phloridzin is to sweep away the glycogen that is present in the different parts of the body. If this passed through the circulatory system as free sugar there ought to be hyperglycæmia in proportion to the glycosuria, which there certainly is not. This being the case, the only conclusion to be drawn is that the katabolised glycogen (sugar) enters into side-chain or loose combination with a constituent (proteid) of the blood, and is thus conveyed to the kidney where it is set free and eliminated."

It will be seen that the view that can be now put forth, emanating from the knowledge that has been acquired during the last few years, and

embodied in the work alluded to, has failed to receive Professor Halliburton's consideration. The effect of the proposition is to take away the ground from beneath his argument and destroy its reality. Previous to the recognition of carbohydrate as a constituent of protein, there could be no conception of what is permissibly entertainable now, and it must be admitted that a difficulty stood in the way of reconciling the facts observable in connexion with the changed state of things occurring in the liver at the moment of death. On the one side, evidence showed that if sugar passed into the circulation as had been suggested, the fact of its doing so could not escape being revealed by the urine, and the state of the urine negatived the possibility of the occurrence taking place. On the other side, there was the active production of sugar that was observed to occur in the liver as a post-mortem effect, and which, if occurring during life, would have established a different state of things from that actually found to exist. In these circumstances, it could only be said that the enzyme action allowed to come into play after death must be inhibited by the conditions existing during life.

With the knowledge that we now possess, it may be considered that no incompatibility exists. Concerning enzyme action, a considerable advance has been made, and it is consistent with what is now known to consider, in relation to the transformation of glycogen into sugar, that the agent concerned in effecting the process does not primarily exist in the liver in the state of enzyme, but in that of zymogen. Enzymes are dual bodies, and the mother substance of them, zymogen, possesses no activity. The co-operation of another body, the activator, is required to give it enzymic power. In other instances, the activator is brought into play as it is required, and here the conditions leading to a demand for carbohydrate from its storage may set the activator free and start the enzyme into motion in the manner needed. It may well be that the altered conditions occurring at death may lead to a removal of the restraining influence that held things in proper check during life. The same may be said with regard to blood coagulation. The zymogen, or proferment, of thrombin is present, but is devoid of activity, so long as the co-operative agent is held from exerting its activating effect.

Looking at the distinguished position that Professor Halliburton holds as a teacher of physiology and the weight that his writings carry in the mind of members of the medical profession, I cannot help regarding it as very regrettable that the evidence which nullifies his argument should have escaped being noticed. It is medicine that suffers in connexion with the matter, for without a right physiological basis, there can be no rational comprehension to guide the medical practitioner in

dealing with the wrong metabolism which stands at the root of diabetes.

Is it to reversed enzyme action that the conversion of glycogen into sugar is due? Everyone admits that the building up of glycogen from sugar constitutes an important function of the liver. We look to enzyme action as the agency effecting the process, and it is now recognised that, by altered surrounding conditions, the line of action that has been in operation may be changed into one of a reverse nature. I see nothing inconsistent with the building-up enzyme in the cells of the liver being influenced by its environment in such a manner as to lead to the occurrence of a reversal of action, and thus to give rise to a breaking down of the previously built-up glycogen into sugar.

It is interesting to note the analogous behaviour that is traceable between carbohydrate and fat in their connexion with bioplasm, and to this point I will now proceed to direct attention. We have seen that carbohydrate becomes incorporated in the bioplasmic complex, and that, if not consumed when there brought into relation with oxygen, another component of the complex, it may, under circumstances of redundancy, be cleaved off as storage material.

The effect of modern research is to give to fat a place in the bioplasmic molecule, and thus to put it into the same position as carbohydrate. I need not, I consider, here enter into the details of this matter. It will suffice to state that there is evidence to show that fat may exist in a locked-up state in a protein compound in like manner to what occurs with carbohydrate. In these circumstances, the fat is in an out-of-sight state, but is susceptible of being brought into view by the disruptive agency of peptic digestion. It is only recently that this subject has fallen under consideration, but already it has made its way into prominent notice.

With the point reached, the position of things stands as follows: the bioplasmic molecular complex, which may be regarded as the representative of a living unit and thereby as the seat of the metabolic changes which give rise to the phenomena of life, contains both carbohydrate and fat incorporated within it. Through intramolecular action, set in motion by agencies of an enzymic nature, the various occurrences noticed to ensue may be conceived to be brought about. In the molecule, oxygen also enters as a constituent, and thus circumstanced, it is brought into close relationship with the carbohydrate and fat components with which the interactions occur that give rise to the development of energy. The play that takes place is not considered to consist of straight off or unbroken oxidation, but of oxidation, step by step, of the components of the

chain of which the vanishing molecule is made up. The result, when the intramolecular procedure is normally carried out, is the production of carbon dioxide, water, and ammonia,—products devoid of latent energy. Should it happen, as may in the presence of abnormal conditions be the case, that arrest at an intermediate stage takes place, the effect is the throwing off of a product retaining unexhausted energy.

I have shown that, with a redundancy of carbohydrate, glycogen is dissociated for storage purposes. Condensation, or building up within the bioplasmic molecule, must be here in operation, seeing that it is in the form of sugar, and not glycogen, that the carbohydrate enters the molecule. Precisely the same sort of thing happens in the case of fat. Under the existence of a redundancy, fat becomes, by cleavage from the bioplasmic molecule, microscopically visible where none, whilst in a locked-up state, was previously to be seen. Here again constructive work must be performed, inasmuch as neutral fat is devoid of the needed dialysability to permit of its passage through cell membranes to reach the bioplasm within. The transport must occur in association with a dialysable state, and an enzyme—lipase—exists widely distributed through the body, which performs the office of breaking down fat into fatty acid and glycerine, when transmission through a cell membrane is wanted. This operation, followed by saponification, provides for the transmission, and then, should the conditions be such as to lead to neutral fat coming into view, a re-synthetic action is brought into play. What has been stated stands in accord with the teachings of the present day, and it is seen that the line of procedure in the case of fat fits in with that appertaining to carbohydrate.

These phenomena cannot for a moment be conceived to issue from the effect of mere chemical action working independently of the influence of living power. Everything tends to show that actual incorporation in living matter precedes metabolic activity. Living matter is made up of more or less highly complex molecules, and, thence, saying that a body enters into the constitution of living matter is tantamount to saying that it enters into the composition of the complex molecules of which it is made up. This renders it justifiable to speak of living action as resulting from incorporation of food-stuff in the bioplasmic molecules and its subjection to the influences that are there existing. Intramolecular activity in this way stands at the foundation of living action.

Now, taking carbohydrate and fat, it has to be said of them that they both, in a suitably hydrolysed state, become linked on to the bioplasmic molecules. What subsequently occurs depends upon the circumstances

at the time existing. If they are oxidised, they disappear in the form of carbon dioxide and water, giving rise to the liberation of a concordant amount of energy of one kind or another. If they are not consumed in this way, and the supply of nutrient material goes on, they become dissociated and laid by as storage stuff, the carbohydrate in the form of glycogen, and the fat in the form of glycerine or neutral fat.

I strongly demur to the terminology that is in common use among pathologists in connexion with this matter. It is a terminological inexactitude to speak of these operations as falling generically in the category of degenerations. They are virtually in themselves of a physiological nature, and, moreover, constitute representations of, it may be said, the largest and the widest spread class of action occurring in the living world. Look at the production of starch, cellulose, etc., and of fats in the vegetable kingdom, and of glycogen and fats in the animal kingdom, as the issue of indisputable physiological procedures. It is through bioplasmic agency that the phenomenon is brought about. Either carbohydrate or fat, entering the bioplasmic complex and not being oxidised or consumed, will not remain fixed there, but be dissociated or thrown off in one form or another, according to the potential conditions existing. Carbohydrate may enter and be thrown off as carbohydrate, and fat as fat; or, it may be, that carbohydrate may be taken on and fat cleaved off, or fat enter and carbohydrate be cleaved off.

Illustrations demonstrative of these actions are readily obtainable from the vegetable kingdom. With respect to the production of fat from carbohydrate, I may cite a passage from Sachs, quoted in my "Physiology of the Carbohydrates" (page 247). "Before maturity such (oily) seeds contain no fat, but only starch and sugar. Such unripe seeds (e.g. of *Pœonia*) may be detached from the mother plant, and allowed to lie in moist air with the result that the starch disappears and is replaced by fatty oil." With respect to the production of carbohydrate from fat, the growth of the oily seed suffices to afford a demonstration. From the oily seed placed in contact with water, a young plant springs, just as happens with its starchy congener, the fat obviously constituting the source of the cellulose that comes into existence. Concordantly, there cannot be any doubt about fat emanating from carbohydrate as a metabolic procedure in the animal kingdom, but concerning the production of carbohydrate from fat, I do not consider that any point of evidence is yet before us that can be definitely said to settle the question.

I submit that, in the dissociation process of which I have been speak-

ing, carbohydrate and fat stand upon identically the same ground. The matter is very simple and intelligible. Both form an integral part of bioplasm. If in excess, arising from supply, or from production within as in the case of fat from carbohydrate, of the consumption taking place, they become dissociated as storage material.

The dissociation seems to play a balancing rôle. What is not used is for the time thrown off. This is well seen in the case of yeast cell growth in association with a plentiful supply of sugar. The sugar is taken, and that which is in excess of application is thrown off as glycogen. The adipose tissue cells, although replete with fat, go on taking it if it is presented to them. Because it is not actually wanted does not stop the process of taking on. When the supply fails and it is wanted elsewhere, then a reverse action occurs, and it is taken back and transported to where it is needed for consumption, just in the same way as occurs with carbohydrate. What I submit is that, as a general principle of action, the taking on does not necessarily cease when what is taken on is not consumed.

Here lies the foundation of the so-called degenerations. They simply represent thrown off material which has been incorporated into bioplasm, or produced within it, in excess of consumption. The liver is full of activity in this way. Standing in the position it does in relation to food, it is brought into contact with supply material to a greater extent than happens elsewhere, and do we not accordingly find that in this organ, more than anywhere else, accumulation of fat and carbohydrate is observed to take place?

Thus I have been dealing with the supply as standing at the foundation of the condition that may happen to be met with. Taking the other side of the question, a check to consumption may be the determining cause of accumulation. Whilst consumption is balanced to supply, no opportunity exists for the occurrence of dissociation. Should consumption, however, fall short, surplus material will come into existence and show itself as a dissociated product. The two main sources of dissociation of this kind are deficient supply of oxygen and inactivity. From whatever cause arising, these conditions are known to give rise to accumulations of both fat and glycogen. Damage of cell bioplasm through toxic agency, as, for instance, from diphtheria, etc., will by the instrumentality of its check to activity, give rise to the condition that is being considered.

Under the view set forth, the whole matter is placed upon a rational basis and made clear and intelligible. Degradation of protein into fat,

after the manner that was formerly entertained, does not enter into the question. The operation, in fact, consists of a throwing off, precisely as is done upon a most extensive scale, as a normal metabolic procedure, in both kingdoms of living nature. The act of throwing off, as has been seen, is subordinated to the influence of the collateral conditions existing. When these conditions are normal, the process is a physiological one, and there is nothing of a degenerative nature about it. It is only when the throwing off is occasioned by a pathological state that the term "degeneration" can be justifiably applied to it. The distinction that applies to the terms "growths" and "hypertrophy" is strictly applicable in connexion with the point under consideration. To use the term "generation" in the manner that is too often done, is absolutely unscientific and misleading.

We learn, both experimentally and clinically, that the pancreas is mixed up with carbohydrate metabolism, and let me now pass to the consideration of this subject, and see the kind of reading that may permissibly be put upon the facts that have been disclosed in connexion with it.

Our predecessors of many years back recognised that disease of the pancreas was from time to time met with in the post-morten examination of persons who had died of diabetes. The recognition in modern times that diabetes follows experimental extirpation of the pancreas, stands in conformity with this, and, as it is found experimentally that for the production of the effect the extirpation must be complete, so from modern clinical experience it is learnt that partial disease of the organ may exist without being attended with diabetes, whilst with extensive disease of it, diabetes may be expected to be found as a concomitant.

Something, then, derived from the pancreas is apparently concerned in contributing to the normal metabolism of carbohydrate, inasmuch as in the absence of this something, carbohydrate shows itself as sugar in the system in a manner that does not occur when the proper passage to utilisation is carried out. Now, in the proper passage of food molecules to utilisation, a preliminary linking on to the various bioplasmic molecules of the body is, at the present time, pretty generally admitted to take place. It is not conceived as at one time was done that the food molecule is consumed in the form of an isolated entity. Toxins, when in a position to be incapable of being taken on by the constituent molecules of bioplasm, fail to exert any toxic effect. It is only when they become actually linked on to the bioplasmic molecules that the inter-

actions that are needed to evoke the results which are capable of being produced by the particular toxin concerned, can occur. So with food molecules, they must be embodied into the bioplasmic molecules as a preliminary step to utilisation. Thus placed in these molecules, they are brought into relation with the other constituents, notably oxygen, which presumably is present in a loosely combined state as in oxyhæmoglobin, and put into a position to permit of the interactions attended with oxidation, and the liberation of energy that are observed to take place.

Analogy may be appealed to for assistance in the comprehension of the procedure involved in the linking on of the food molecule to the bioplasmic complex. We learn from what occurs in connexion with toxins and of lysins (hæmolysins and bacteriolysins), that there is an intermediary body, the amboceptor, through which the junction with the bioplasmic molecule is effected. In the absence of the play of this intermediary body, no junction and no effect follow the presence of the toxin and the lysin in the blood. A large amount of closely reasoned experimental work, with much of it of a test-tube nature, stands at the foundation of the conception that has been put forward, and gives to it a well-grounded qualification for acceptance.

Proceeding on with the matter, it may further be said that, whilst the body that is linked on (in immune phraseology called the complement) is thermo-labile or susceptible of destruction under exposure to a moderately elevated temperature, the agent that links on (amboceptor) may be exposed to a boiling temperature without losing its linking-on power, and is, therefore, in contradistinction spoken of as thermo-stable. This is an important point in connexion with the train of reasoning that I am about to set forth.

It is contended that the first step towards the utilisation of carbohydrate is linking on to the bioplasmic complex. Without susceptibility of being linked on, it simply filters through the body and runs out with the urine without being in any way touched. This is the case, for instance, with the disaccharides,—saccharose, lactose, and maltose, when under any circumstances reaching the circulatory system as such. With the mono-saccharides,—dextrose, levulose, and galactose, on the other hand, we find that these, when present in the circulation, do not wholly escape in a similar manner. A portion fails to pass out with the urine, and this portion, it may be assumed, becomes put into the combined state, and subsequently made use of in the ordinary manner. If no capacity existed for linking on these monosaccharides, it is not conceivable that

they would be any more susceptible of utilisation than the group which is not utilisable.

The effect following the introduction of the different sugars into the circulation by intravenous injection has been already alluded to. It has been seen that a certain amount of power exists of putting the monosaccharides into a position to be made susceptible of retention in the system. A great contrast, however, is to be perceived in the extent of power that exists at the seat of absorption in the alimentary canal to deal with the sugar derived from the food, as compared with that existing in the blood. Notwithstanding the large amount of carbohydrate that may be ingested with the food, we find, with its reception into the organism in a normal way, that it effectually become assimilated, or put into an altered state, and thus prevented the general circulation as sugar. Introduced, on the other hand, in a direct manner into the circulation, the evidence afforded, alike by the urine and by analytical examination of the blood, shows that it is only comparatively slowly and in limited quantity susceptible of being thrown out of view, by the power that is here encountered.

Protein and carbohydrate are similarly circumstanced in connexion with this point. The digestion products of both are rapidly put out of sight after absorption from the alimentary canal, and are not to be traced on into the general circulation. Introduced into the circulation, both are, to a certain extent, susceptible of being dealt with and removed from view, that which is not so dealt with, flowing off, in each case with the urine. Professor Starling, in a paper published in Vol. XIV of the *Journal of Physiology,* says with reference to the results obtained from the injection of peptone and sugar into the blood: "It will be seen from them that the behaviour of peptone after injection is almost exactly analogous to that of sugar."

What is it that occurs in connexion with the disappearance of carbohydrate to account for the phenomena? A portion may be taken by the tissue bioplasmic molecules, if there is a want of it to replace side-chains that have been worked off. Evidence, however, is forthcoming to show that there is to be found within the blood itself a means by which sugar may be carried out of view.

Besides carbohydrate in the form of sugar, carbohydrate in the amylose form is obtainable from blood. After the removal of the sugar by treatment with alcohol, the precipitated matter is capable of yielding a certain amount of carbohydrate in the amylose form, after having been subjected to the breaking down influence of boiling with potash. This,

under ordinary circumstances, is found to amount to about 1 per 1,000 of blood. I have for a long time known that the amylose carbohydrate that is thus capable of being obtained from blood, shows itself in greater amount after the introduction of sugar into the circulation. I gave illustrations of this in my "Physiology of the Carbohydrates," published in 1894, and regarded the fact as constituting a noteworthy point.

Later, I recognised that if I introduced sugar into the circulation in conjunction with a boiled aqueous extract of pancreas, the amylose carbohydrate was to a decided extent further increased. The experiments on this point are set forth in my "Carbohydrate Metabolism and Diabetes" (page 71 *et seq.*). It seems to me that without doubt, the conclusion may be drawn from them that the pancreatic extract supplies something which contributes to the conversion, by the bioplasm existing in the blood, of sugar into amylose carbohydrate. The following supplies an epitome of the results obtained.

I need not here enter into the question of the mode of estimation of the amylose carbohydrate. This matter has been fully referred to in my previous writings, extending over many years past. Suffice it to say, that, upon the strength of some hundreds of estimations, I consider that confidence may be placed in the trustworthiness of the results yielded by the procedure adopted.

In the first place, 11 determinations are given derived from normal rabbit's blood. The figures for the mean of these stand at 1.41 grammes of amylose carbohydrate per 1,000 grammes of blood, the maximum figures being 1.55, and the minimum 1.25. The figures, therefore, throughout the list stand very closely together.

In 5 determinations made from blood collected at varying periods up to 30 minutes after the intravenous injection of 1 gramme per kilo. bodyweight of dextrose dissolved in saline solution, the mean figures were 1.61 per cent., the maximum being 1.80, and the minimum 1.52. Two determinations were made after the lapse of an hour from the time of the injection. The figures came out at 1.43 and 1.34, showing that any effect that might have been previously produced had passed off.

In the case of levulose similarly dealt with, the figures in 2 experiments from blood collected at 15 and 30 minutes after the injection were 2.60 per cent. and 2.67 per cent. as against 1.81 in one experiment from blood collected at the end of an hour. Looking at these figures, no doubt can exist of the amylose carbohydrate having been raised by the levulose injection.

Two experiments were made to see the effect of injecting saline solu-

tion alone. The figures from blood collected at the end of 15 minutes came out in each case at 1.35 per cent.

Passing to the experiments with the pancreatic extract, two experiments were conducted in which the extract alone was injected. In one, the blood was collected at the end of 15 minutes, and the figures given were 1.77 per cent. In the other, the blood was collected at the end of 30 minutes, and the figures given were 1.52 per cent.

In 13 experiments, the pancreatic extract was employed with 1 per kilo. bodyweight of dextrose. The mean of the figures yielded came out at 2.03 per cent., the maximum being 2.47 and the minimum 1.57.

In 4 experiments of a similar nature with levulose, the mean figures stood at 2.07 per cent. with the maximum at 2.56 and the minimum at 1.74.

One experiment was conducted with the injection of the raw extract of pancreas in association with dextrose. The injection proved immediately fatal, and the figures met with were 1.04 per cent. These low figures are not surprising, seeing that the physical effect of the injection of the sugar solution would be to lead to a dilution of the blood, firstly from the fluid injected, and next from the hypertonicity given to the blood leading to fluid being drawn into it from the tissues.

Five experiments are recorded with the subcutaneous instead of intravenous, injection of pancreatic extract and dextrose. The mean figures stood at 1.77 per cent., the maximum being 2.09, and the minimum 1.52.

In one experiment of a like nature with the employment of levulose, the figures stood at 2.30 per cent.

With reference to the precise signification of these experiments, all that is at the present moment needed to be done is to urge that they suffice to show that the pancreatic extract really exerts an action in relation to the passage of sugar into amylose carbohydrate. I will now enter upon the question of *modus operandi.*

The amboceptor in immunity phraseology seems to stand as the representative of the co-ferment concerned in enzyme action. It is now known that enzymes are dual bodies, and that the two parts are capable of being separated from each other. When separated, neither possesses any enzymic power. One is destructible by heat and seems to be the active agent, corresponding with the complement in immunity language. The other does not lose its virtue by subjection to boiling, and thus stands in the position of that which gives power to thyroid and suprarenal extracts. Taking the expressed juice of yeast, which contains

zymase,—the enzyme which converts sugar into alcohol and carbonic acid, a given quantity of the fresh juice has been found experimentally to have its enzymic power doubled by the addition of an equal quantity of boiled juice. This means that an extra quantity of the co-ferment, which possesses no inherent active power, gives increased power to the essentially active principle of a "complement" nature that is present in the juice.

The effect of the co-ferment is seen to be comparable to that of the pancreatic extract, and both, on account of having been exposed to a boiling temperature, must be devoid of energy-exerting power. It is obvious that the co-ferment must, in some way or other, contribute the assistance to the potential part of the enzyme which enables it to bring about the increased effect that has been spoken of. The possession of a linking-on power of an amboceptor nature would suffice to supply what is wanted, and in functioning in this way, an explanation is afforded of its mode of action which satisfactorily fits in with the explanation given in connexion with operations of another, but probably allied, nature.

In the case of hæmolysins and bacteriolysins, it seems to have been experimentally reduced to demonstration that a something becomes developed within the blood which plays the passive part of connecting a lytic body (complement), present as an ordinary constituent of the blood, with that which undergoes dissolution. Without the aid of this connecting body (amboceptor), the red corpuscle and the bacterium fail to be attacked, notwithstanding they are surrounded by "complement." The amboceptor is reasonably assumed to possess a linkage capacity which leads to its joining up the complement with the red corpuscle or the bacterium, and thus placing it in a position to exert its lytic influence upon them, which, in the absence of the junction, it is powerless to do.

Through the instrumentality of the amboceptor, then, the complement is linked on to the bioplasm, and until this occurs no action takes place. The food molecule also requires, as I have before said, to be linked on to bioplasm before it can be turned to account. I think it is now pretty generally admitted that it is within, or as an integral part of bioplasm, that it is made use of, and that whilst outside bioplasm, it can no more be metabolised than a toxin molecule that has had its linking-on capacity abolished can produce a toxic effect.

Molecular configuration has been spoken of in connexion with the chemical union of bodies and it has been asserted that there must be a mutually adapted configuration to permit of junction taking place.

Now, why may it not happen that amboceptor aid is required for linking the sugar molecule on to bioplasm? The facts before us bearing on the position held by the pancreas in relation to the matter under consideration, suggest that it is. Acceding to the proposition that an amboceptor is needed for the linking on of the sugar molecule to bioplasm, and that the pancreas is concerned in its supply, everything fits in and becomes placed on a clear and intelligible footing. If the aptitude does not exist for the monosaccharide molecule to be linked on to bioplasm, it becomes placed in the same position as a disaccharide molecule, which, whilst remaining as such, plays no part in connexxion with living matter, and, if reaching the system, becomes thrown off with the urine in the same way as any other extraneous or unutilisable material.

The point reached is that the facts before us suggest that the pancreas supplies amboceptors which, by effecting the attachment of the sugar molecule to the bioplasmic molecule, place it in a position to be disposed of according to the existing environment. It may undergo oxidation and disappear with the liberation of energy. It may become transmuted into glycogen (amylose carbohydrate). For this, it must be conceived, to pass in the first place, into bioplasm, in the same manner as the hydrolyte is conceived to pass into union with the enzyme preparatory to being converted into another form. Or it may be transformed into fat by a process analogous to that of transmutation into glycogen—that is to say, as a result of a molecular rearrangement taking place within the bioplasmic complex. The liver cells, in a marked manner, afford illustrations of the capacity existing in bioplasm of producing glycogen and fat from sugar. The action is comparable to that of a ferment, in so far that a body enters in one form and is thrown off in another.

In the case of the intravenously injected sugar without the pancreatic extract, it has been seen that a small increase in the amount of amylose carbohydrate obtained upon that normally obtainable, occurred. This may be taken to be attributable, under the view adopted, to amboceptor derivation from the pancreas normally existing in the blood. The linking-on agency would be increased by the association of the pancreatic extract with the sugar solution, and here the amylose carbohydrate was found in a very distinct manner to be further augmented. The facts exist with which the reading given fits in as a rational deduction.

I look upon the leucocytes of the blood as one of the agencies concerned in the primary metabolism of carbohydrate matter. They admittedly feed upon material that may chance to be present in the blood, and in this way extrinsic nutrient matter that may happen incidentally

to reach the blood may be appropriated and built up into bioplasm, which, like that of the lymphocytes, may pass by autolysis into the blood proteins. We have here an agency that may be instrumental in putting available matter of any kind that may in any way get into the blood, into a condition of elaborated blood pabulum.

As yet I have only applied the line of argument adduced to action occurring in the blood. But the blood is not the medium designed for the food carbohydrate to be dealt with. The work of construction into bioplasm is performed before the blood is reached by the agency of the lymphocytes. Upon this subject I have already fully spoken. Leucocytes are little masses of growing bioplasm. Lymphocytes are, in this sense, the same, and the same train of occurrence in connexion with growth may be reasonably assumed to ensue. By analogy the line of working with respect to the point before us may be carried from the one to the other. If the amboceptor is in operation, as a means of linkage of the sugar molecule to the bioplasmic molecule in the leucocyte, it may be equally taken to be similarly in operation in the lymphocyte.

This brings the ambocepter factor into connexion with the broad question of the passage of carbohydrate into the assimilated state. That it does become an incorporated constituent of protein is regarded as an accepted fact. With this before us, let it be supposed that through faulty action the carbohydrate molecule should fail to become linked on to the bioplasmic molecule, what, it may be asked, would be the state of things produced? The sugar molecule would be left untouched, and would thence pass on into the circulation in a free state, which is tantamount to saying that there would be glycosuria proportionate in extent to the carbohydrate ingested and failing to become assimilated.

If the amboceptor is concerned in performing the office suggested in connexion with the appropriation of carbohydrate by incorporation into bioplsm, it may not unreasonably be considered to be similarly concerned in the transmutation of sugar into glycogen in the liver. The passage of sugar into glycogen constitutes a building-up operation. There are grounds for believing that the sugar in the first instance becomes taken into bioplasm. Afterwards, from the redundancy existing, a shedding off in the form of glycogen would follow, in conformity with what is conceived in circumstances of the kind to ordinarily occur. Viewed in this way, the amboceptor, if needed for the bioplasmic assimilative operation, may be reckoned to be also needed for the transmutation of sugar into glycogen in the liver.

Experience in connexion with diabetes points strongly to a fault of

the nature here depicted, standing at the foundation of the show of sugar that occurs. In the passage of ingested carbohydrate to its natural destination, a certain chain of events is passed through. A faulty link in the chain, through such a defect as has been spoken of, would suffice to lead to a breakage of action continuity. A faulty cog in the metabolic mechanism is amply sufficient to account for the arrested progress of onward movement that renders itself perceptible through the sugar that comes into, and ought not to come into, view.

The theory of glycolysis, as enunciated by Lépine, appropriately falls in here for consideration. As long as Lépine held to the canons of the glycogenic doctrine, which imply destruction, and thereby disappearance, of sugar in the transit of the blood through the systemic capillaries, there was a show of reason in seeking for an explanation of the disappearance. But how does the matter stand when he retires from his former position and denies the occurrence of the disappearance? This, in reality, is the issue of his recent experimental work, evidence being adduced by him showing the existence of more sugar (instead of less) in the blood returning by the veins than in that contained in the arteries. He, at the same time, speaks of a *virtuel* sugar (which I take to be the same as my combined or locked-up carbohydrate) as a source of the sugar that thus comes into view.

Lépine now endorses what I have all along contended for—namely, that there is not the evidence of sugar being destroyed in its transit through the systemic capillaries that was formerly taken to exist. If such be the case, glysolysis stands upon nugatory ground, and it has always been a mystery to me how a proposition, resting upon so inconsistent and illogical a basis, should have received the attention that has been given to it.

Even supposing there should be an element of truth contained in the results derived by Lépine from his pancreatic extract and blood incubation experiments, I think a different interpretation can be assigned to them from that which he has given. On the question of validity, the general opinion is that they are open to mistrust, but supposing any loss of sugar to have taken place, may it not have been through incorporation into bioplasm instead of through destruction? He affirms that the leucocytes are mixed up with the action, and likewise that chyle, with its lymphocytes and absence of red corpuscles, possesses greater glycolytic power than blood.

The trend of all modern work is to point to the chemical actions connected with living matter being of an intramolecular nature, and it is

difficult to conceive that action occurring outside the living molecule, as Lépine contends for, can constitute the mode of operation. No one thinks of structural formative power being otherwise than associated with the operations of actual living matter. Ought not the chemical phenomena to be viewed in the same way?

Under the assumption of the occurrence of glycolysis in the blood, Otto Cohnheim and others, particularly on the American side of the Atlantic, speak of diabetes being due to sugar failing to be *burnt* in the system. Nothing could be more gratuitous, unfounded, and misleading. There is not a particle of evidence to show that defective oxidising power exists in connexion with diabetes. The real fault is a condition antecedent to the oxidising operation. The food carbohydrate, when permitted to reach the general circulation in the form of free sugar, through failing to be assimilated, cannot do otherwise than run off with the urine, and thence escape being placed in a position to undergo oxidation. In the case of the dissociation of sugar from built-up bioplasm in the "composite" type of diabetes, there is no ground for thinking that defective oxygenating power has anything to do with the matter. Whilst the sugar molecule is being thrown off by the operation of a wrong lytic action, oxidation is proceeding in an ordinary way to permit of life being maintained.

(To be concluded.)

DEMONSTRATION OF THE SPIROCHÆTA PALLIDA FROM A MUCOUS PATCH OF THE CONJUNCTIVA.

BY

HANFORD MCKEE, B.A., M.D.

Upon April 21st last I was asked to see a patient at the Montreal Maternity Hospital because of the swelling of her right lower lid. The patient, H. R., 25 years old, was very poorly nourished, had a bad cough and was the subject of syphilis. She had a scar on the vulva, a rash had been present but had now almost disappeared. Her mouth was a mass of mucous patches; glandular involvement was marked.

Dr. Covernton had noticed some swelling of the right lower eyelid the day previously and to him I am indebted for calling my attention to a rare condition. She did not complain of any pain or unpleasantness about the eyes. The right lower lid was somewhat swollen, especially along the edge of the outer quarter; the eye was watery and the conjunctiva markedly congested. Upon pulling down the right lower lid there was seen on the palpebral conjunctiva, upon the outer quarter of its surface, an area which had a decidedly different colour than the rest of the conjunctiva. The peculiar pale blue hue contrasted so plainly with

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the reddened conjunctiva that the whole border of the patch was very definitely shown. Somewhat oblong in shape, it extended laterally from the middle fourth of the lid to almost the outer canthus and from before backward from the edge of the lid to the fornix. The diagnosis, from the clinical condition of the patient, and the appearance of the lid was, a mucous patch of the conjunctiva. Slides were prepared from the mucous patch by Dr. R. P. Campbell who was good enough to see the case with me and stained by Giemsa and modified methods. In all the spirochæta pallida was found in quantity. In some fields as many as six or seven typical spirochætae were seen. Slides prepared from the mucous patches of the throat showed spirochæta pallida and refringens.

Burnett in Norris and Oliver says there would seem to be no reason why mucous patches should not occur during the regular course of the disease on the conjunctiva as well as on other mucous surfaces and several such cases have been reported. One case at least has been reported in which a true gumma had its seat on the conjunctiva. The only reference which Fuchs makes to syphilis of the conjunctiva is on syphilitic ulcers which he says are among the greatest of rarities; still rarer is the soft chancre of the conjunctiva. The position of the spirochæta pallida in eye conditions is as follows:—(1) the finding of spirochæta pallida in apparently healthy eyes of infants who have died from congenital syphilis, (2) its discovery in lesions set up experimentally in the eyes of monkeys and rabbits by the inoculation of syphilitic material, (3) its discovery in actual syphilitic lesions of the human eye. Stephenson found the spirochæta pallida in the aqueous humour of a woman with irido-cyclitis in the course of the early secondaries, also in the scrapings from three cases of Keratomalacia in syphilitic infants. Babs found the spirochæta pallida in the eyes of three syphilitic still-born fetuses, and finally we have the finding of the spirochæta pallida in the case here reported. A mucous patch of the conjunctiva is a rare condition and, while the spirochæta pallida has been found in a number of eye conditions, I would not be surprised if this were the first report of its demonstration from a secondary lesion of the conjunctiva. On this point the translator in Axenfeld's books says: "Until the present, syphilitic lesions of the eye, hard sore, secondary and tertiary affections, have given no opportunity for their bacteriological examination. If the spirochæta pallida is confirmed as the cause of syphilis and the signification of the silver impregnation methods be established the determination will be of enormous value to the ophthalmologist." The patient was put upon anti-syphilitic treatment and made satisfactory progress. No local measures were applied to the conjunctiva which cleared up quickly.

A PLATE FOR THE RELIEF OF PAIN IN THE FIRST METATARSO-PHALANGEAL JOINT.

BY

J. APPLETON NUTTER, B.A., M.D.

During the past year I have had referred to me a number of cases of disability in the feet where pain in the metatarso-phalangeal joint of the great toe was the distinguishing feature. These were treated according to their etiology by foot-plates, strapping, baking and other orthodox methods. To my chagrin I experienced great difficulty in effecting a cure, and indeed many of the cases failed to respond at all. After persevering for some weeks I was driven to adopt new tactics, and the idea occurred to me of affording rest to the painful joint, but without confining my patients to bed. Such relief seemed possible by the use of a foot-plate made with a high inner arch,which would thus bear more than its accustomed share of the body weight. The plan seemed logical, but before committing myself to it I sought the advice of one of my former teachers in a distant city. On receiving his endorsement and advice I had the plates made which are being passed around. The results obtained by mechanically protecting the painful joints have been so thoroughly satisfactory wherever they have been tried, that I have thought the matter worth bringing before your attention. In each case a cure is being effected by giving rest to the painful joint, and relief is being obtained after many years of pain and discomfort.

As you know, the head of the first metatarsal bears a large proportion of the weight which comes upon the front of the foot. This weight-bearing function naturally resists any effort to relieve an inflammatory condition of the joint. Hence a plate that will relieve the painful joint of its burden of weight-bearing will aid materially in its cure.

Chronic pain in the first metatarso-phalangeal joint is met with frequently.

Shoes which are too narrow, and which crowd the metatarsal bones together laterally, have furnished a majority of the cases which have come under my observation.

Hallux valgus, generally the result of too narrow shoes, is itself often accompanied by pain in the joint. When severe and especially when paroxysmal it is generally attributed by the patient to gout. Mechanical treatment of this deformity, as by applying splints to bring the toe into line, is seldom satisfactory, as the apparatus generally causes more discomfort than the deformity itself. Under the heading of mechanical

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Read before the Montreal Medico-Chirurgical Society.

treatment is not meant to be included the protection of a painful bunion from the irritation of the shoe. In such a case the pain is periarticular, and not in the joint itself.

Weakness in the longitudinal arch has been a frequent cause, and in fact the pain from such a weak foot may be largely confined to the region of the great toe-joint. In some cases simple support to the arch will cause all pain to disappear, in others, where the inflammatory process is more deeply rooted, the joint in question needs individual attention.

In another group of cases we find this joint picked out for the attentions of rheumatism, rheumatoid arthritis, and gout. Sometimes cases of rheumatoid arthritis are so severe as to lead to a suspicion of tuberculosis of the first metatarsal.

Inflammatory conditions of this class are frequently combined with weakness of the foot, and the two conditions must be carefully differentiated. The most common example is an infectious arthritis in young adults with weak feet, causing nearly constant pain in the great toe-joint, and a pronounced limp, associated with similar pains elsewhere, as in the shoulder or fingers. This may or may not show swelling of the periarticular soft parts.

In the case of weakness of the transverse arch, the cause of Morton's metatarsalgia, the pain is commonly referred to the distal extremities of the outer metatarsals, and seldom attacks the first.

As regards diagnosis, it is most essential to be able to estimate how much of the disability is due to so-called rheumatism, and how much is the result of weakness of the longitudinal arch. Now weakness in the longitudinal arch manifests itself perhaps earliest by two signs. The first is a bulging or convexity on the inner side of the foot over the region of the head of the astragalus and the navicular bone, seen when the foot is bearing weight. If this bulging be marked, and especially if it be present when the foot is *not* bearing weight, the longitudinal arch is probably giving way.

The second sign is limitation of voluntary inversion of the foot. This action takes place largely in the mediotarsal joints, and when the longitudinal arch is being flattened it is mechanically restricted.

In making a diagnosis of rheumatic or rheumatoid conditions it is important to find other manifestations of the disease. If, for instance, bad weather brings on pain in the great toe-joint of a patient with a weak foot, and if this is accompanied by an aching finger which shows a Heberden's node, we can be fairly sure that we have to deal with more than static disturbance in the foot. At times, however, it is necessary, as a therapeutic test, to have recourse to strapping or even a foot-plate.

In designing a support to afford relief to the first metatarso-phalangeal joint, a cast of the foot must be made. Upon this plan a comfortable plate extending from the centre of the heel to the heads of the metatarsals, with the following essential additions, (1) a quick rise just behind the head of the first metatarsal, so as to raise this from the ground; (2) a doming up of the plate under the heads of the second and third metatarsals. When placed in the shoe and walked upon the patient at once notices that the affected joint is bearing no weight, and as a rule experiences relief immediately. It may take a day or two, however, before walking can be indulged in freely. If properly made they are quite comfortable. The plate must, of course, be regarded as a crutch, to be discarded when no longer absolutely necessary. After a month or two of freedom from pain the patient should be allowed to walk an hour or more daily without it, this period to be gradually increased until its use may be entirely discontinued. While being worn, appropriate exercises for a weak foot should be practised, if such a condition co-exists.

As a rule the shoes worn by the patient are too tight across the front of the foot, and are all the more so when the plate is in the shoe. For this reason it is usually necessary to procure new shoes, made very broad and roomy.

Although these plates suggest a blacksmith and a workshop more than they do a pathological laboratory and microscopical technique, yet I feel sure that they are none the less valuable on this account. Should you meet with a case of obstinate pain in the metatarso-phalangeal joint of the great toe, have a plate made that will give the joint a rest, and I am sure you will be gratified by the result.

THE SURGICAL TREATMENT OF NON-RESILIENT DIVERTICULA OF THE BLADDER.

BY

E. M. VON EBERTS, M.D., M.R.C.S. (Eng.), Surgeon to the Out-patient Department of the Montreal General Hospital.

The comparative infrequency of large diverticula of the bladder has prompted me to report in detail a case which I have observed, and to review the methods employed in the surgical treatment of this affection.

While cystoscopists of experience are apparently agreed that diverticula of the bladder associated with urethral or prostatic obstruction or the presence of stone are relatively frequent, such sacculations, whether single or multiple, are usually unassociated with peridiverticular adhesions and tend to disappear after the removal of the cause of increased intravesical pressure. In this connection I wish to deal only

with that form of diverticulum, usually of large capacity, which, owing to the existence of adhesions to the surrounding organs or the paucity of the muscular element in the sac wall, is characterized by the absence of expulsive force. From the point of view of pathogenesis one should not include as true diverticula those cases which are a sequence of perivesical suppuration, although from the point of view of diagnosis and treatment they are indistinguishable from such as result from attenuation of the bladder wall through pressure.

Varieties. Large diverticula may be either congenital or acquired. I am not aware of any case in which a diverticulum has been found post-mortem in infancy; Pean's [1] case, however, strongly supports the congenital theory, as does a case reported by Hofmokl and Ghon,[2] especially as in the female the conditions chiefly considered as causative factors, such as urethral stricture and prostatic hypertrophy, do not exist. Nor was there found in these cases any evidence of spinal injury or disease.

Symptomatology. The variations in the symptom complex in vesical diverticula are so numerous that I have given somewhat in detail the symptomatology in each case of the series reviewed. A case reported by Murchison [3] illustrates in a striking way the occasional obscurity of the urinary relation and the difficulties of diagnosis where cystoscopy cannot be carried out. Generally speaking, however, the symptoms complained of are those of an acute cystitis, that is pain, frequency of micturition, and the passage of cloudy, malodorous urine. Micturition may be associated with severe tenesmus. The frequency with which a tumor has been found, generally situated to one side of the median line, is noteworthy. Possibly, however, the most characteristic symptom is the ability of the patient to repeat the act of micturition after a short interval. In such cases the introduction of a catheter after voluntary urination usually evacuates a large residue. While the stoppage of the stream in the first act is no doubt due to the passage of the vesical contents in the direction of least resistance, that is into the diverticular sac, a reversal of this process is initiated as soon as the expulsive efforts of the bladder cease, and continues until the pressure in the two cavities is equalized. Where the diverticulum occupies a dependent position there is always residual urine, and one generally fails in attempts to wash the bladder clean,—which adds greatly to the difficulties of the cystoscopist. The writer's case illustrates very well this latter point, as upon first examination, owing chiefly to the fact that the distending fluid was cloudy, the presence of a diverticulum was overlooked.

In the majority of cases there is a history of recurring febrile attacks

associated with chills, with or without symptoms of renal involvement.

Where the diverticulum replaces an abscess cavity, there is, of course, a history of the sudden evacuation of a large amount of purulent urine. This symptom of urgency is also associated with those cases in which a sudden evacuation of the diverticular contents follows periodical occlusion of the orifice.

Complications. The burden of the literature on this subject deals with post-mortem findings, the cardinal complications observed being severe vesical or diverticular inflammations, displacement and dilatation of the ureter, pyonephrosis, perivesical abscess, peritonitis and femoral thrombosis. Pressure upon and deflection of the ureter above its intramural course is a frequent complication and leads eventually to dilatation of the ureter and of the renal pelvis. With the advent of infection there follows in consequence of the ureteral obstruction widespread renal suppuration and impairment or destruction of the renal function. In the author's case the renal symptoms were decidedly the most striking when the patient first came under observation, the presence of a diverticulum remaining unrecognized for some time. In cases III, V and VII of the series reviewed the diverticular orifice was found to occupy the normal site of one of the ureters, and the ureter of the corresponding side to discharge directly into the diverticulum. Careful perusal of the cases reported strongly substantiates Young's [4] opinion that this condition of affairs is due to a gradual inversion of the ureteral orifice through extension of the diverticulum and not to sacculation of the ureter itself.

Treatment. Catheterization. The use of the catheter for retention and irrigation is at best a makeshift, as, owing to the fact that the communication with the bladder seldom provides dependent drainage, irrigation cannot possibly give permanent relief or even free the urine from pus. There are no successful results recorded from this method of treatment.

Drainage. Suprapubic cystostomy undoubtedly gives temporary relief and is properly undertaken in weak individuals. The absence of resiliency in the diverticulum, however, deprives this method of treatment of any permanent value. In a case reported by Burckhardt [5] a perineal drain was inserted but the patient died.

Enlargement of the orifice. In considering this form of treatment the position of the diverticulum must be one's chief guide. Where the accessory sac is found to underlie the trigone of the bladder, or where the most dependent portion of the diverticulum is on a lower level than the base of the bladder, treatment by this method cannot be expected to

yield a cure. Where, however, the diverticulum is in the course of the urachus, or is so placed that the incision may be carried to its lowest level and still be above the base of the bladder, it is conceivable that the result might be satisfactory, provided there remained no obstruction in the course of the urethra, either from enlarged prostate, spasm of the sphincter, or urethral stricture. As the reflection of the diverticular wall upon the outer surface of the bladder may extend for only a short distance around the opening of communication, the corresponding cut edges of the bladder and diverticulum should be carefully approximated by sutures in order to forestall the danger of an extravasation into the pelvic cellular tissue. A case reported by Young [4] in which this method of treatment was followed, resulted in the re-establishment of voluntary micturition but a residual urine of 300 c.c. necessitated the use of the catheter at bedtime.

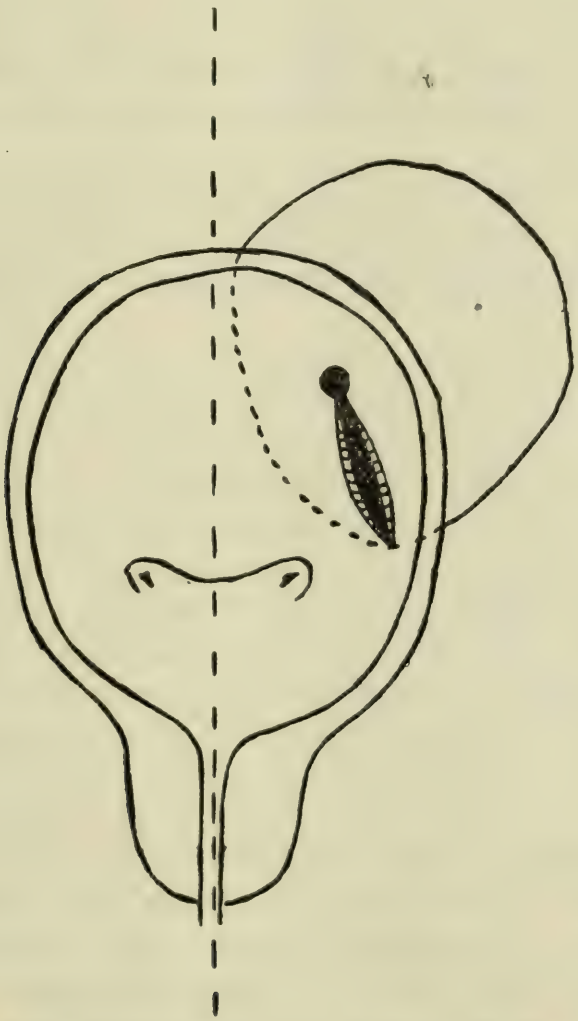

Diagram I.—Illustrating Operation of Enlargement of Orifice.

Suture of the orifice of the diverticulum without excision of the sac has been practised by Pousson,[6] who reports a case in which after the mucosa of the diverticulum had been thoroughly curetted and the margin of the orifice freshened, closure was effected by means of catgut sutures. The operation is said to have been successful, but the procedure, for very patent reasons, is not to be recommended.

Complete excision of the diverticulum. This would appear to be the only method yielding permanently satisfactory results. Where obstruction is present it should be dealt with primarily, or at least at the same time that the excision of the diverticulum is carried out. Further. in cases where pyonephrosis exists as a complication, and examination of the segregated urine shows extensive impairment of the renal function, it would seem rational to deal in a radical way with the complication before attempting bladder suture in the presence of a constant inflow of purulent material.

The literature contains the reports of ten cases treated by complete excision, which owing to the varied symptomatology and different operative methods employed are, in addition to the author's case, given somewhat in detail.

(1) *Author's Case,* 1906. R. F., aged 32, was first seen on October 27, 1906. His complaints were pain in the right loin, frequency of micturition, interruption of the stream and attacks of fever. His family history was negative.

Personal History. Since adolescence he had experienced difficulty in emptying the bladder, the act requiring as a rule several minutes. In 1897 he contracted a severe urethritis, which became chronic and was complicated at first by cystitis and later by what was diagnosed as pyelitis. Subsequently there was marked impairment of health; the urine from time to time became extremely cloudy and fœtid, and frequent attacks of cystitis, occasionally complicated by retention, necessitated the use of the catheter. Throughout this period a marked irritability of the sphincter urinæ led to frequent interruptions in the act of micturition. In 1902 the patient was sent to Arizona for one year, where he subsisted largely on milk diet with beneficial results. After his return to work he was from time to time interrupted in his vocation by attacks of cystitis, necessitating bladder lavage and the use of urinary antiseptics. In August, 1906, a severe febrile attack intervened, associated with pain in the right side. In September a second and in October a third attack similar in every way occurred. It was during convalescence from the last attack that the patient came under my observation.

On examination there was found tenderness on deep pressure in the

right flank. The bladder dulness extended above the symphysis halfway to the umbilicus. The urine was cloudy, specific gravity 1.018, acid, and contained albumen, casts, and a large quantity of pus. The residual urine amounted to 200 c.c. The act of micturition was prolonged by pressure upon the lower abdomen. The evening temperature was 103°F., falling to 99° in the morning.

Digital examination of the rectum showed the prostate to be normal; the seminal vesicles were slightly thickened and somewhat tender. Above the prostate extending to the right could be felt a large, boggy mass which was considered to be a dilated, atonic bladder.

A cystoscopic examination by Dr. R. P. Campbell on October 30 revealed the following facts:—

The bladder held 350 c.c. with but a slight feeling of distention. The bladder wall was hypertrophied and trabeculæ were everywhere visible; some cystitis was present, most marked about the trigone, but not sufficient to account for the quantity of pus present. The urethral orifice appeared normal and the ureters were easily catheterized. The right ureteral terminal was displaced towards the median line. The urine from the right ureteral catheter flowed steadily drop by drop (evidently from a dilated ureter) filling two test tubes, while the secretion from the left side, flowing at a normal rate, filled one-half a test tube. The urine collected by catheter from the bladder and from the two kidneys when compared showed:—

	COMMON	RIGHT	LEFT
	Turbid	Turbid	Clear
	Acid	Acid	Acid
Sp. G.	1010	1009	1025
Albumen	Present	Present	Trace only.
Urea	—	0.8%	2.0%
	Pus	Pus	No pus.
	Bacteria	Bacteria	No bacteria.
	Blood cells.		
CULTURES			
	B. Pyocyaneus	B. Pyocyaneus	An occasional Colony
	B. Coli.		of B. Coli.

Diagnosis. Spasm of the sphincter, hypertrophy and dilatation of the bladder, chronic cystitis, dilatation of the right ureter (above the ureteral sphincter), chronic suppurative pyelonephrosis.

Rest in bed and lavage of the bladder effected within a few days a

marked improvement in the patient's general condition, the evening temperature falling to 99½°. An attempt was made by means of vaccines prepared from devitalized cultures to induce a bacterial immunity to both B. Pyocyaneus and B. Coli Communis under strict opsonic observations. Before inoculation with composite vaccine the index to B. Pyocyaneus was 1.25 and that to B. Coli 2. On November 18 the indices were 2.5 and 6 respectively. At this time the temperature showed an increase in the evening registration, and fearing a recurrence of the former severe febrile symptoms with attendant toxæmia, I decided to remove the right kidney.

On November 22 a nephrectomy was performed under ether anæsthesia. As was expected the ureter, pelvis and calices were found greatly dilated. Secreting tissue remained in isolated areas, chiefly at the two poles, and there could be seen macroscopically numerous small abscesses throughout the gland. Cultures from the pelvis of the kidney upon agar slants yielded within twenty-four hours pure growths of B. Pyocyaneus. Following the operation there was an immediate cessation of the pyrexia. As, however, in spite of daily irrigation of the bladder the urine continued to be cloudy, on December 5 under a general anæsthetic a suprapubic drain was inserted. On exploration of the interior of the bladder a small opening was observed to the outer side of the right ureteral orifice through which purulent material exuded. A probe thrust into this opening could be felt per rectum to pass to the posterior wall of the pelvis. The orifice of communication was found to admit readily large blunt forceps, through the open jaws of which a drainage tube 1 c.m. in diameter was inserted. The anterior extremity of the tube was then sutured to the margin of the suprapubic wound.

Following this procedure the urine showed a very marked decrease in the amount of pus present. At the end of ten days the diverticulum tube was removed and at the end of three weeks the suprapubic opening was allowed to close. The temperature maintained an afebrile course. During the next two months the bladder was irrigated daily and upon several occasions the suprapubic wound closed only to open again in from four to six days. Throughout this period it was noticed that although micturition could be readily initiated, the stream rapidly declined after the passage of 240-280 c.c. A few minutes later the patient was able to pass a similar amount, this state of affairs being due evidently to the passage of the urine on contraction of the bladder into an accessory cavity offering less resistance than the via naturalis. It was further observed that if catheterization were employed, the instrument if re-introduced in ten or fifteen minutes evacuated a further amount of 180-250 c.c.

A cystoscopic examination was again undertaken and the existence of a large diverticulum demonstrated. The opening from this into the bladder was found about 2½ c.m. to the outer side of the right ureter. This cavity was further determined to be of large dimensions, probably capable of holding 200-250 c.c., as it was possible to introduce the cystoscope through the opening (1 c.m. in diameter) into a cavity which appeared to be almost as large as the bladder itself.

Operation, February 28. Extravesical, extraperitoneal excision of the diverticulum; re-establishment of suprapubic drainage.

Under ether anæsthesia a vertical incision was made through the lower segment of the right rectus muscle. The peritoneum was readily stripped back to the upper margin of the diverticulum, but owing to the close adhesion of the wall of the accessory cavity to the outer surface of the bladder for some distance from the opening of communication, it was found impossible to isolate the neck of the sac without re-opening the suprapubic wound. With the tip of the left forefinger passed through the orifice of the diverticulum and used as a retractor and guide, the separation of the diverticulum from the bladder was readily effected. After the neck of the sac had been divided, the bladder was closed extravesically by means of a purse-string suture. This was re-inforced and the bladder wall further inverted by a continuous catgut suture. The enucleation of the sac presented little or no difficulty. It was found to extend below for a considerable distance undermining the trigone, behind to the posterior wall of the rectum and laterally to the pelvic wall. Drainage of this cavity was provided by means of a rubber tube passed behind the prostate and through the perineum without communicating with the urethra. Complete closure of the lateral suprapubic incision and partial closure of the suprapubic wound after excision of scar tissue concluded the operation. Intravesical pressure was provided against by means of a small suprapubic syphon. Convalescence was rapid and uninterrupted. The perineal drain, which was apparently unnecessary, was removed on the third day, and at the end of three weeks, after I had determined by cystoscopic examination through the suprapubic wound that the diverticular opening was firmly united, the suprapubic syphon was removed.

A miscroscopic examination of the excised diverticulum showed the wall to consist of several layers of flattened cubical epithelium; a well-defined submucosa; muscle bundles running in various directions, and externally a layer of loose connective tissue.

Owing to the recurrence from time to time of a suprapubic fistula, the patient was given an anæsthetic on May 18, and the sphincter urinæ

dilated to 42 F. with a Kollmann instrument. The suprapubic wound closed finally within ten days.

On June 15 the patient was discharged well. The urine at this time was clear and contained but few pus cells and bacteria. The residual urine varied between one and two ounces.

Subsequent History. Apart from a mild attack of prostatitis in May, 1908, at which time there was a residual urine varying between one-half and two ounces, the patient has been free from urinary symptoms.

Remarks. In reconsidering this case in detail, I am of the opinion that the diverticulum was most likely congenital in origin, although I am aware that this is not capable of proof; the early symptoms, however, support this view. With such a condition existing an infection alone was necessary to produce the subsequent train of symptoms; this in time arrived. It is further probable that infection of the kidney was favored by the pressure of the diverticulum upon the ureter at some little distance from its vesical orifice. This theory would also account for the extreme dilatation of the ureter without involvement of its vesical terminal.

If the diverticulum were of recent development, the spasm and hypertrophy of the sphincter must be considered the etiological factor, as they furnished sufficient obstruction to produce sacculation. As an illustration of the degree of obstruction produced by the sphincter, one has only to recall the repeated failures to close the suprapubic wound.

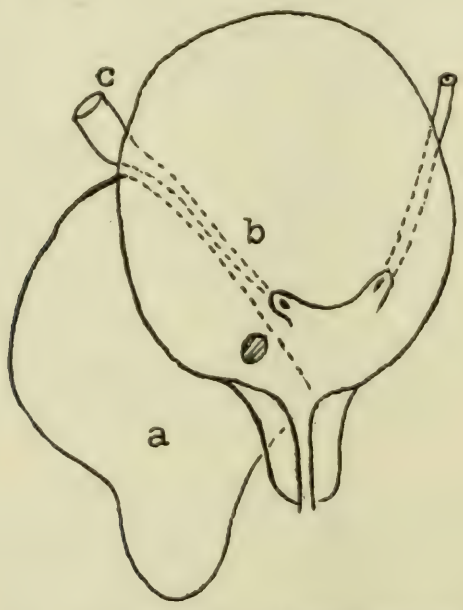

Diagram II.—Illustrating Author's case. (a) Diverticulum, (b) Displaced Ureter and Ureteral Orifice, (c) Dilated Ureter above intramural course.

Abstract of cases. (2) *Pean's Case,* 1895.[1] Congenital vesical

diverticulum and supernumerary urethra in a girl aged fifteen. There had been incontinence from birth. On examination there was found on the anterior wall of the vagina a median protrusion the size of a nut. On digital pressure over the tumor urine was seen to escape from a narrow opening placed in the median line 3 mm. below the external orifice of the urethra. On obstructing with the finger the supernumerary external orifice and again exerting pressure, there was a gradual diminution in the size of the tumor, and the patient complained of a desire to micturate. Under a general anæsthetic an incision was made over a director along the anterior wall of the vagina, the diverticular tract excised, and the opening into the bladder sutured. The patient was cured.

(3) *Czerny's Case,* 1896.[7] A young man, aged 31 years, developed after traumatism a stricture of the membranous portion of the urethra followed by retention, cystitis, and pain in the region of the left kidney. On examination there was found to the left of the median line a tumor the size of a child's fist which on compression discharged its contents into the bladder. Suprapubic cystostomy disclosed a greatly thickened bladder with a finger-shaped prolongation towards the navel. In the region of the left ureteral orifice a large diverticulum was demonstrated, the opening of communication admitting the finger. The accessory sac completely filled the small pelvis, and contained foul urine and epithelial detritus. Suprapubic drainage was continued for a fortnight without freeing the urine from pus, and excision of the diverticulum was decided upon. The left rectus was incised transversely. Many adhesions were encountered especially in the region of the rectum and in the hollow of the sacrum. During the operation the peritoneum and the left ejaculatory duct were injured. The left ureter was dilated and passed obliquely through the wall of the diverticulum. It was divided and implanted into the bladder wall. The wall of the excised diverticulum contained muscular and epithelial elements. Convalescence was retarded by the formation of a ureteral-abdominal fistula. Four months later the left kidney, the seat of pyonephrosis, was extirpated. At the time that the patient was discharged, the bladder held 150 c.c. and he was able to retain his urine from two to three hours.

(4) *Riedel's Case,* 1903.[8] The patient, aged 61 years, was admitted to the Surgical Clinic in Jena December 20, 1902. He had experienced difficulty in urinating for three years. Latterly the use of a catheter had been necessary. On examination there was found marked enlargement of the prostate. Prostatectomy was performed. Five months later, in May, 1903, symptoms of obstruction returned with pain

in the right side above Poupart's ligament, for the relief of which a perineal section was performed. On June 13, 1903, suprapubic cystostomy revealed the presence of a large diverticulum communicating with the bladder through an opening 2 c.m. in diameter. The bladder was closed and a second incision made through the right rectus muscle. The accessory sac was excised and the communication with the bladder closed with catgut suture. Perineal drainage was re-established. Collapse and death occurred on the following day.

(5) *Pagenstecher's Case,* 1904.[9] The patient, a male aged 33 years, was seen in August, 1903. During the preceding winter he had suffered for two or three days from pain in the bladder and on micturition. Five weeks later the pain had returned with strangury and tenesmus every half hour. On admission the distended bladder could be felt above the pelvic brim. After evacuation with a rubber catheter, a solid instrument when introduced withdrew a further amount of turbid, bloody urine, with the disappearance of the abdominal tumor. On subsequent irrigation the bladder was found to hold as much as one litre. Cystoscopy was unsuccessful and on August 30, 1903, suprapubic exploration was undertaken. In the position of the left ureter was found the opening of a large diverticulum.

As there was no improvement in the patient's condition following drainage, extirpation of the diverticulum by the sacral route was carried out on December 16. The left ureter, which opened into the accessory cavity, was implanted into the bladder at the former opening of communication. A self-retaining catheter was placed in the urethra. The excised sac contained in its walls bundles of smooth muscle fibres running in various directions and a well marked submucosa. Of the epithelial lining only a few fragments were preserved. In addition to a sacral fistula the suprapubic wound continued to discharge for some time. In February both fistulæ had healed, but in March the sacral fistula reopened, urine escaping during micturition.

(6) *von Eiselsberg's Case,* 1904,[10] *reviewed by Christel.* In the discussion upon Pagenstecher's paper, von Eiselsberg reported a case of vesical diverticulum which had come under his observation, in which a palpable suprapubic tumor disappearing under pressure was followed by a desire to micturate. The presence of a diverticulum was confirmed by cystoscopic examination, the orifice of communication with the bladder being situated at the base. Excision of the sac was successfully practised. Details as to operative procedure and histological examination of the sac wall are not given.

(7) *Young's Case,* 1904.[4] Male, aged 30 years, was seen in Janu-

ary, 1904, complaining of frequency of micturition and pain in the back. There was a history of severe attacks of urethritis in 1893 and 1898. During the last attack a tight stricture in the bulbo-membranous region was found to exist, for the relief of which a combined external and internal urethrotomy was performed. During the next three years the patient was free from urinary symptoms. About April, 1902, he had an attack lasting one week characterized by obstruction and frequency of micturition. Three months later a second attack similar in every way occurred. In September, 1903, a third attack supervened, and in October a fourth attack with pain in the right side of the pelvis and severe tenesmus culminated in the sudden passage of a quantity of pus. It was thought that an abscess had ruptured into the bladder. Although retention occurred, a catheter could be passed without meeting with obstruction. Bladder lavage was practised without diminution in the amount of residual urine. On December 9 pain and tenderness developed in the right flank beneath the costal margin. On January 4, after coming under observation, the patient had a similar attack lasting several hours, necessitating the use of morphia. At this time fever, nausea and the presence of muscular rigidity over the right kidney were observed. Examination showed the prostate to be slightly harder than normal, but there was no evidence of stricture. There was a residual urine of 350 c.c. The bladder was washed clean with difficulty. Pressure on the lower abdomen was necessary to evacuate completely the bladder contents. The cystoscope revealed a large diverticulum with an orifice of communication 2-3 c.m. in diameter, situated in the position of the right ureteral opening. The left ureteral orifice was found displaced towards the left, with the opening of a second and smaller diverticulum lying above and to its outer side. The right ureteral orifice, of course, could not be seen, but it was subsequently found to open upon the inner wall of the larger diverticulum. For six weeks catheterization and lavage were practised, but without diminution in the size of the diverticulum or in the quantity of residual urine.

Operation, February 10. Suprapubic extravesical excision of the large diverticulum and intravesical enucleation of the small diverticulum with closure of the orifices was carried out; also drainage of the bladder through a perineal urethrotomy and drainage of the retrovesical space by means of a tube passed behind the prostate and through a posterior perineal incision without entering the urethra. The intradiverticular emplacement of the right ureteral orifice was brought forward into the plane of the bladder wall by means of a flap operation.

Owing to the failure of the suprapubic wound to heal, the presence of

30 c.c. of residual urine, and the recurrence of a small pouch at the site of the excised diverticulum on the right side,—all indicating obstruction,—a Bottini operation was performed on August 4.

Examination of the wall of the excised diverticulum showed the presence of an epithelial lining and numerous layers of smooth muscle bundles running in various directions. There was also present the usual evidence of chronic inflammation.

Five months after operation the patient reported his urine to be clear and the function of urination normal.

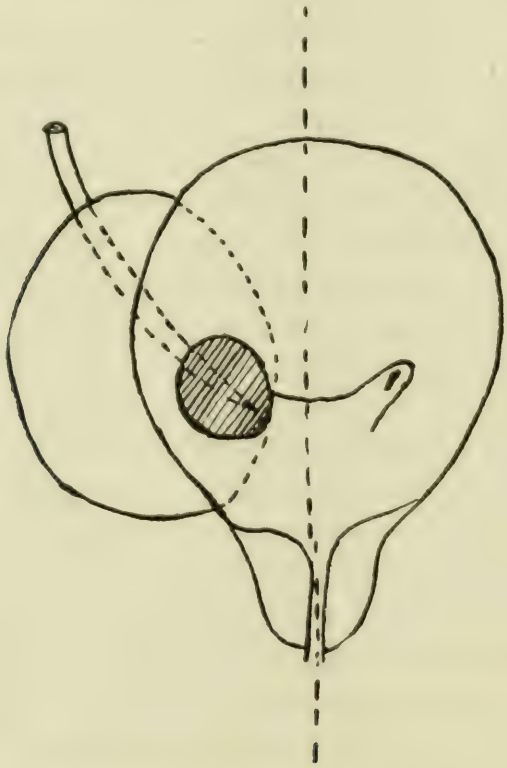

Diagram III.—Illustrating Case VII. (After Young).

(8) *Young's Case,* 1904.[4] Male, aged 34 years, was admitted to the Johns Hopkins Hospital on January 18, 1904. In March, 1899, the patient jumped from a moving locomotive striking upon the buttocks. Following the accident he felt severe pain in the lower portion of the abdomen, and on examination found a lump about the size of a hen's egg below and to the left of the umbilicus. This swelling gradually subsided. There was, however, a return of the pain at the site of the tumor if the bladder were allowed to become distended.

On cystoscopic examination there was found in the region of the vertex the small orifice of a diverticulum. The bladder wall was not trabeculated.

Operation, January 28. Excision of a small diverticulum lying within a dilated urachus. On February 23 the patient was discharged well.

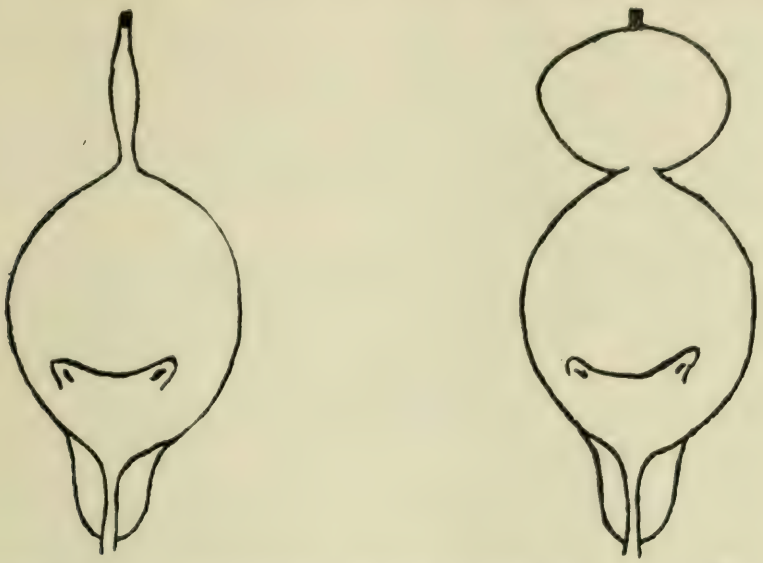

Diagram IV.—Diverticula in course of urachus. (After Young).

(9) *Young's Case,* 1903.[4] Male, aged 63 years, was seen in February, 1903. In 1901 the patient first noticed frequency of urination and difficulty in starting the stream. At the time of admission urine was voided about every fifteen minutes. The patient had never had complete retention and a catheter had never been used.

On examination the urine was found to be normal. The prostate was moderately enlarged. On passing a catheter 1200 c.c. of residual urine was withdrawn. Cystoscopic examination showed intravesical prostatic hypertrophy, moderate trabeculation of the bladder wall, and on the right side anteriorly the opening of a diverticulum.

Operation, February 22. Suprapubic extravesical extraperitoneal excision of the diverticulum with suture of the orifice of communication; perineal prostatectomy. Enucleation of the diverticulum was effected without difficulty owing to the absence of dense adhesions. The capacity of the diverticulum was estimated at 500 c.c. The bladder itself was not opened. The patient was discharged well on the 27th day following operation.

Microscopically the mural elements consisted of well defined mucous, sub-mucous and muscular layers. There was no evidence of inflammation.

(10) *Porter's Case,* 1907.[11] This patient, a male aged 34 years, first came under observation in April, 1906, complaining of difficulty in starting the stream, of frequency of micturition, and of the passage

of foul urine which occasionally contained clotted blood. On examination the bladder was found to extend to the umbilicus. The residual urine varied from 19 to 24 ounces. Treatment at this time was declined. When the patient returned one year later digital examination of the rectum showed the prostate to be moderately enlarged and cystoscopy revealed the presence of three (?) diverticula, one of which was especially large, with its orifice of communication situated at the right side of the base of the bladder.

On April 30 suprapubic drainage was established. On May 21st the bladder was re-opened suprapubically, and the sphincters of the diverticula widely dilated. The patient was discharged in August, but leakage still occurred from the suprapubic wound.

He returned in September suffering from epididymitis and pain in the region of the left kidney.

Operation, September 8. An incision was made parallel with Poupart's ligament. The peritoneum was opened and an elastic swelling the size of a banana, extending backward and to the left of the base of the bladder, was found. In order to separate the accessory sac from the rectum, the bladder was again opened and the forefinger inserted into the diverticulum as a guide and retractor. In this way the sac was isolated. The orifice was closed with two layers of catgut sutures. Suprapubic drainage was provided and a rubber catheter placed in the urethra. At the end of October the patient was reported to be much improved in health, but, in the absence of urethral drainage, leakage still occurred at the site of the bladder suture.

(11) *Wulff's Case,* 1904.[12] The patient, a male aged 34 years, first experienced difficulty in micturition in May, 1903. In July, while confined to bed, he suddenly lost the power of voluntary urination. A large quantity of urine was withdrawn by catheter. Although voluntary micturition was subsequently restored, there remained a residue of one litre which, however, did not produce discomfort. The condition was at first thought to be due to a disturbance of the sensory nerve supply. On examination some months later there was found in the right lower quadrant a large tumor, which catheterization failed to reduce, but which, on pressure, suddenly discharged into the bladder a large quantity of fœtid, brownish-yellow fluid. Cystoscopy showed the presence of a diverticular opening on the right side.

Operation. An incision was made parallel with Poupart's ligament, the peritoneum stripped back, and the diverticular sac opened and evacuated. The cavity was then tamponed.

Three weeks later the sac was resected and the orifice of communica-

tion with the bladder sutured. Intravesical tension was provided against by means of a permanent urethral catheter.

Several weeks later, owing to the failure of the bladder suture line, the opening into the bladder was again exposed and the edges freshened and re-sutured. At the end of a further period of several weeks the patient was discharged. The wound had healed. The urine, voided spontaneously every three hours, was for the most part clear. There was a residue of 150-200 c.c. On cystoscopic examination the mucous membrane at the site of the suture was found to be firmly united. Whether the presence of the residual urine was due to atony of the vesical wall following the prolonged distension, or whether due to defective enervation, had not been determined.

The wall of the excised sac contained epithelial and muscular elements.

Etiology. Of the series of 11 cases reviewed, I, II, V, VIII, X and XI belong to the congenital variety, although positive evidence of congenital origin can be said to exist only in Case II, reported by Pean.[1] In this connection it is fallacious to lay too much stress upon the presence of bladder epithelium and muscular tissue in the wall of the accessory sac, as these elements may be present in cases where prostatic hypertrophy has been considered the etiological factor (IX), and also in cases in which a urethral stricture has existed (III and VII).

To prostatic enlargement may be ascribed the development of the diverticulum in Cases IV and IX. Porter's[11] case may belong to this category. The note on the prostatic condition is not very definite. While the age would suggest a congenital origin, it does not exclude a prostatic causation.

Urethral stricture was present in Cases III and VII. Owing to the persistence of obstructive symptoms (that is pouching of the suture line and residual urine) after extirpation of the diverticulum, a Bottini operation was performed in Case VII with permanently satisfactory results.

The etiological factor in the case reported by the writer must remain in some doubt; the history on the one hand suggests the possibility of the diverticulum having been congenital, while on the other the presence of hypertrophy and spasm of the sphincter urinæ cannot be left out of consideration.

Traumatism was undoubtedly the exciting cause in Case VIII. The urachus had probably remained patent from birth.

Perivesical suppuration has to be considered as possibly the precursor of the diverticulum in Case VII, in view of the history of a sudden evacuation of a large quantity of pus. Opposed to this theory are the

facts that a stricture had existed in the bulbo-membranous portion of the urethra and that the diverticulum was lined with epithelium and contained muscular elements in its wall.

While no case of diverticular formation secondary to congenital stricture of the meatus urinarius has been reported, the possibility of this condition figuring as an etiological factor should be borne in mind.

Phimosis was associated with the formation of a vesical diverticulum in a child 21 months old, observed by Lennander [13] and cited by Young.[4]

Spinal injury or disease as an etiological factor was first suggested by Hale White.[14]

von Eiselsberg's [10] case (VI), owing to the absence of details, cannot be classified.

Age. It will be seen from the foregoing that, apart from Cases IV and IX (prostatics aged 61 and 63 years respectively) and the case reported by Pean,[1] all those included in our series occurred in individuals between the ages of thirty and thirty-four. This fact is most striking and suggests the possibility that they were all congenital in origin; that is to say, even the two cases with a history of pre-existing stricture present features which bring a congenital hypothesis within the limit of reason.

Prognosis. Out of the 11 cases reviewed the operation of excision of the diverticulum was followed by the restoration of the normal function of urination in eight instances. In two cases urinary fistulæ persisted at the time of their being reported, and in one case the operation was followed by collapse and death. The age at which the majority of these cases occur imposes a grave responsibility upon the surgeon. With modern methods of investigation, physical, biological and chemical, applicable to the urinary tract, a correct diagnosis should practically always be made early in the affection, and with a method of procedure well established these cases should be accorded a favorable prognosis.

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PERFORATIVE APPENDICITIS: VENOUS THROMBOSIS, PARATYPHOID, INTESTINAL OBSTRUCTION.

BY

JAMES BELL, M.D.

The patient was a young farmer of 23 years of age from the Eastern Townships, who came to the Royal Victoria Hospital on the night of the 30th December, and was operated upon for an acute typical perforative appendicitis on the following morning, December 31st.

His illness had begun on the night of the 26th after serious dietetic indiscretions during that afternoon and evening. The appendix was removed and the wound drained. The patient did well for eight days when he had a severe chill on the 8th of January, one on the 9th and another on the 13th, the temperature rising to 104° and 105° following these chills. The temperature remained high, although the wound had healed and the condition of the abdomen was quite satisfactory.

I suspected a portal thrombosis, but no definite evidences of such condition developed. I then began to suspect typhoid fever, and 15 days after operation a positive Widal was obtained. On the 22nd of January, organisms of the paratyphoid variety were obtained from blood smears and on that day he was transferred to the medical side under care of Dr. Hamilton.

Up to this time, the bowels had moved regularly and freely, and there were no indications of deranged digestion. But, on the 23rd, he began to vomit and had an unsatisfactory and imperfect evacuation of the bowels. On the 24th, he appeared to be suffering from obstruction and on the 25th I saw him and found him apparently in an almost moribund condition, signs quite definitely indicating obstruction of the bowels, and, as I had already suspected thrombosis or some form of interference with the circulation on account of the previous chills, I was inclined to believe that it was a mesenteric thrombosis causing paralysis of the intestine.

I decided to operate in the afternoon, although I felt that he would probably not survive the ordeal. I found a definite mechanical obstruction. The omentum had become adherent at the brim of the pelvis and

encircled a loop of small intestine,—the lower part of the ilium. The obstruction was easily overcome, and the distended upper small intestine was evacuated by puncture. By the administration of intravenous salines and stimulants, the patient rallied well. His bowels moved; fæces and flatus were passed freely and the obstruction was completely relieved. The only unsatisfactory sign, however, was that he still had a weak and rapid pulse. He had no pain, declared that he felt well and had no elevation of temperature.

He died rather suddenly at 3.40 on the morning of the 28th, *i.e.* three days after operation.

Autopsy: The autopsy showed that there had been typhoid fever, healed and healing ulcers of the small intestines, appendectomy, septic thrombosis of the inferior vena cava, iliac and pelvic veins.

At the operation for obstruction, as soon as I had opened the abdomen, I immediately examined the portal and mesenteric veins, but did not think of investigating the inferior vena cava or the iliac veins, and so concluded that my suspicions of thrombosis based upon the series of chills had been unfounded.

I was unable to explain the death until autopsy revealed these conditions of thrombosis.

There were also evidences of nephritis and acute ulceration of the rectum which was probably due to repeated enemata. This, therefore, was a perfectly healthy young man developing a typical appendicitis after indiscretions in diet. The appendix would seem to have perforated thirty-six hours before operating, judging from the symptoms.

I did not consider that there was any evidence of typhoid fever clinically, and, even when 15 days after operation a Widal reaction was found, I still doubted the diagnosis. From the fact that his chills began on the 8th day after operation and the first evidences which were demonstratable of typhoid were found on the 15th day, it would seem that he must have developed the typhoid after coming to hospital.

Another extraordinary complication was the development of intestinal obstruction 22 days after operation. There were absolutely no signs prior to that time.

Altogether his case presents a series of pathological conditions which is quite unusual and until the diagnosis was cleared up by autopsy, it was very puzzling.

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ARGYLL ROBERTSON.

It is with much regret that we have to chronicle the death of Dr. Argyll Robertson, the celebrated Scottish ophthalmic surgeon, which occurred on January 3rd, at Gondal, India, whither he had gone on a pleasure trip in November last. Although Argyll Robertson had retired from active practice, some five years ago, he will nevertheless be greatly missed in Scotland, where his charming personality as well as his great professional abilities had made for him a host of friends and admirers. He was born in Edinburgh in 1837, his father being a noted surgeon and teacher, who practiced to a limited extent the, at that time, new specialty of ophthalmology. Dr. Argyll Robertson after graduating in Medicine from St. Andrews devoted his attention to ophthalmology, being a pupil of the celebrated Von Græfe, in Berlin. Shortly after returning to Edinburgh he became attached to the Royal Infirmary from which he retired in 1896, at the same time resigning his teaching appointment in the University.

He enjoyed wide popularity and had a large practice, which may have accounted for the comparatively small amount of writing he produced. In his earlier days, he wrote an article on the use of Calabar bean, and another on the loss of the pupillary reaction to light in locomotor ataxia, now so well known as the Argyll Robertson phenomenon. Later he described trephining the sclera as a new treatment for glaucoma, and a few years ago reported a case of filaria loa in the eye. As a teacher, he was

remarkably lucid, but gave his attention rather more to treatment than to pathology. It was as an operator that he excelled; he was neat, deft, resourceful. Dr. Robertson was of splendid physique, and was endowed with the most charming, old-world courtly manner, a courtesy unfailingly exhibited as much to the poorest patient in the hospital as to the titled people who thronged his waiting room. Professionally, he had honours showered on him, was surgeon oculist to the late Queen and the present King, was president of the Royal College of Surgeons of Edinburgh, and President of the Ophthalmological Society of the United Kingdom.

Outside of his professional life, Argyll Robertson was a devotee of golf, and carried off for several years the gold medal at St. Andrews; he was also a noted curler, and a member of the Kings Royal body-guard of Archers, the *corps d'élite* of Scotland. He was an art connoisseur of a high order being one of the judges of the Royal Scottish Academy. As a result of his wide literary attainments, he was a delightful speaker, the well-rounded sentences, the splendid diction, and fine delivery completely fascinating his hearers. It is hard to think that this fine personality is gone for ever. He had his day, he did his duty nobly and well, and the world is much the poorer for his passing.

Reviews and Notices of Books.

PUBLICATIONS OF THE MASSACHUSETTS GENERAL HOSPITAL, BOSTON. Selected Papers by the Staff, Volume II, No. I. October, 1908. Boston, The Barta Press.

This is a pamphlet of 390 pages, containing about thirty papers upon subjects widely diverse but interesting and practical. There seems to be such a wide range of subjects treated in the various contributions that every medical man can find something that will interest him. Illustrations are introduced where necessary.

HIGH-FREQUENCY CURRENTS. By FREDERICK FINCH STRONG, M.D., Instructor in Electrotherapeutics at Tufts College Medical School, Boston, with 138 illustrations in Text. Cloth, $3.00. New York: Rebman & Co., 1123 Broadway.

The author has divided this book into twenty-six chapters and a copious index.

He begins in the first chapter with a historical introduction and goes on in the second to describe what electrons are and their connection with

the various forms of vibratory energy and the waves of radiant energy, showing the relation existing between waves of the slower and larger volume of waves which we recognize as sound waves, and how they increase in rapidity from .16 per second the lowest note we can recognize as a definite note, and how the rapidity increases in frequency by double in rapidity in each succeeding octave and so on till we reach eight octaves, when the rapidity is so great, between 4 and 5 thousand in the second, that the sound emitted reaches the highest note we can recognize as a note, and beyond which the sound loses appreciation by our auditory apparatus and passes on through the heat effects till we reach the vibrations of light varying from 140 millions of millions in the lowest red light visible to the eye to 176 millions of millions per second of the violet ray, and beyond to the X-ray, and ultra violet ray reaching to 200 millions of millions per second; these figures are almost inconceivable by the finite mind.

That these enormously rapid vibrations should produce a profound effect upon the changes which we recognize as life is demonstrated to us every day in the white stalks and leaves of vegetable life when deprived of light and grown in the dark and the energy of life in the spring when the ordinary day light is richer in the violet and ultra violet light at the more rapid moving waves of the spectrum and the changes which take place in the latter part of the summer when the red ray predominates and heat produces the ripening of the fruits and the conversion of the glucosides into sugar. Dr. Strong points out the methods of producing these rapid vibrations by electricity, and describes in a clear and lucid manner the different apparatus made use of for their production, and the different methods of their application to the different cases in which they have been found to be of use.

The text is illustrated throughout with clear drawings and diagrams of the different kinds of apparatus in use. He promises us a second volume which, he says, will be a corollary to the present volume, giving the results of the application of these vibratory movements in actual cases of disease. The present volume is a clear exposition of the facts so far as known and the modes in which the applications are made.

The type is clear and readable, and the book, although well illustrated, not too heavy to read with comfort. To any one wanting to know about high-frequency currents we cordially recommend the book as a good addition to the knowledge of the subject.

G. P. G.

ESSENTIALS OF MEDICINE. A textbook of medicine for students beginning a medical course, for nurses and for all others interested in

the care of the sick. By Charles Phillips Emerson, M.D.; illustrated. Philadelphia and London: J. B. Lippincott Company, 1909.

What Dr. Emerson says in his preface about the confusion of mind of the average student in his fourth year is probably correct, and his book is an attempt to remedy that condition by giving him a better perspective. The author does not err on the side of attributing to his reader too great a profundity of knowledge; indeed the book may be read pleasantly by any intelligent person who will gain some notion, if not an entirely accurate one, of the function of organs from the frequent comparisons which are drawn between them and brick walls, pumps, steam-engines, and furnaces. The permanent value of this method is open to question; since, although it is quite true that "the cell somewhat resembles a steam-engine," it differs from it in so many important particulars that the comparison loses much of its force. The book might be read with profit by a person who intended, but has not yet begun, to study medicine in a school where first-hand information is difficult or inaccessible, and by nurses who "often know a great deal in a general, indefinite, inaccurate way." The teaching of nurses is approximating that of students, and students are being taught as if they were nurses. Eventually they may be taught in one class, and these essentials would make a very good text-book. Our own belief is that medicine must be taught, one thing at a time. Apparently Dr. Emerson's belief is to the contrary, that a general impression should precede the acquirement of precise details. Both cannot be right.

Practical Guides to the Diseases of the Throat, Nose, Ear. By William Lamb. Published by Baillière, Tindall & Cox, Edinburgh and London, 1909.

This is a concise, thorough manual for the student and general practitioner. The examination of the throat, nose, ear, and larynx are illustrated by plates.

The treatment of the commoner diseases of the mouth, larynx, nose and pharynx is clearly outlined. Some very valuable selected formulæ for the therapeutics of these diseases are given at the end of the book. The work is admirably illustrated by some clear and beautiful plates on the different subjects.

Aids to Obstetrics. By Samuel Nall and C. J. Nepean Longridge, London. Published by Baillière, Tindall & Cox.

This is a small, handy volume of the Aid series on Obstetrics for the

use of students and practitioners similar to those of the series which have already been reviewed. Briefly the authors deal with the anatomy of the female pelvis and the process of development and physiology of the fœtus, the care and treatment of the mother during pregnancy and labour, the diseases during gestation and the management of all the different forms of difficult labour, the puerperium and the abnormal conditions found in both mother and child. Different operations such as version, forceps, craniotomy, embryotomy, Cæsarean section, and the choice of anæsthetics are then discussed. Puerperal infection and pelvic cellulitis, phlegmasia alba dolens, pulmonary embolism and puerperal insanity receive mention.

MEDICAL GYNÆCOLOGY. By SAMUEL BANDLER, M.D. Published by W. B. Saunders & Co. Philadelphia and London, 1908. Original illustrations.

This work of some 650 pages is devoted entirely to the consideration of the treatment of diseases of women by means other than the knife. When the operation is necessary, the author does not hesitate to say so, but he confines his remarks to the statement that some form of operation is required. In the opening chapters, the different methods of examining the various sexual organs, as well as the bladder, are well described and there is a short and useful section on the various bacteria found in the genital tract, together with information regarding the modes of culture of these organisms. The treatment of deviations of the uterus by means of the pessary is clearly and conservatively handled, not too much being promised in the way of cure. Abdominal massage, with its indications, is well described, as are also the various kinds of baths, medicated and plain. The work is well got up, contains a sufficient number of illustrations which are good; and, while the pathologist may complain that his subject receives scant attention, it can be recommended to either the general practitioner or specialist.

F. L.

TUBERCULOSIS IN INFANCY AND CHILDHOOD, ITS PATHOLOGY PREVENTION AND TREATMENT. By various writers. Edited by T. N. Kelynack, M.D. Publishers,—Baillière, Tindall & Co., London. Canadian Agents: J. A. Carveth & Co., Toronto, Ont. Size, demyo 8vo. Price, $3.75.

The interest in tuberculosis is perennial, and no matter at what age the disease may fasten upon the tissues, its development always attracts attention. The present volume, devoted to the study of the disease in

infancy and childhood, has been prepared, the editor states, as an expansion of the symposium in the "British Journal of Tuberculosis," and also in view of the great gathering in America, of the representatives of all nations, which must stimulate scientific inquiry, and develop new powers for practical service in the interest of infants and children throughout the world.

The treatise is a collection of studies. The list of contributors to it contains 41 names, and the subjects discussed by these writers are those of greatest interest in the matter of infection of the various tissues, the treatment of the disease both from the individual and the social standpoint, and features of this disease as it is found in children in the various countries of Europe, and in America.

An important feature of this work, is the reference system. Almost every page of the book contains numerous foot references, thus enhancing the value of each article and making the book not only "a comprehensive and authoritative survey" of the subject of tuberculosis, but readily helping those to the original article, when more details are desired. A few of the names of those who have contributed, might emphasize the authoritativeness of this work. L. Emmett Holt, R. W. Philip, John Thomson, A. Calmette, K. F. Andvord, Sir John Byers, A. D. Blackader, T. N. Kelynack, D. J. McArthur,—familiar names to every one who has read diseases of childhood.

The book is well printed, and contains a full index of names of persons, of places, and of subjects. We highly commend it to all who are interested in the subject of which it treats. It contains in all 376 pages and 27 illustrations.

W. F. H.

Soured Milk and Pure Cultures of Lactic Acid Bacilli in the Treatment of Disease. By George Herschell, M.D., London. Second impression, ninth thousand. London: Henry J. Glaisher; Chicago: W. T. Kenner & Co., 1909. Price, 1s. 6d.

This little book of 32 pages deals with the value of lactic acid ferments in the treatment of disease. It is really an amplification of a scientific paper upon the same subject by Dr. Herschell which was published more than a year ago. The discussion is extremely interesting and aims to put upon a reasoned basis the practice of administering milk of varied kinds and degrees of sourness. Cases are cited in which benefit was received from the treatment, from which it would appear that the method has a wide range of usefulness.

WHY WORRY? By GEORGE L. WALTON, M.D., Consulting Neurologist to the Massachusetts General Hospital. Philadelphia and London: J. B. Lippincott Company, 1909.

This book is dedicated by the author to his "long-suffering family and circle of friends, whose patience," he says, "has been tried by his efforts to eliminate worry." That is often the effect of efforts at amelioration no matter how well-meant, but the confession is not an encouragement to reading the book. The present reviewer having nothing to worry him, and therefore feeling incompetent to offer an opinion upon the value of the book, procured a patient for the experiment, a man to whom "the grasshopper is a burden," and the decision was that the process "did him good." The philosophy of the author is cheerful and sound. His illustrations and comment are refreshing and profoundly true, especially those which have to do with golf in its relation to life. One would say that the book will serve admirably to assist one in bearing another person's troubles.

PAIN, ITS CAUSATION AND DIAGNOSTIC SIGNIFICANCE IN INTERNAL DISEASES. By DR. RUDOLPH SCHMIDT, translated and edited by Carl M. Vogel, M.D., and Hans Zinsser, A.M., M.D. Philadelphia and London: J. B. Lippincott Company, 1909. Cloth, $3.00 net.

Pain is universal amongst sentient creatures. It is the subject of all literature, the origin of religion, and the inspiration of medicine. It has remained consistently with created beings since the appearance of a motor mechanism by which the organism might remove the source of it. Originally pain was intended to warn the organism against harm, and it still serves that useful purpose, although life is full of instances in which the pain is out of all proportion to the necessities of the case. But this merely emphasizes the fact that laws which are just and useful in their general application may be unjust, useless and harmful in special cases. The alleviation of pain is the business of the physician and the priest, indeed of all humane men; and when this is done by the removal of the cause we have entered the sphere of modern, scientific medicine. This book of Dr. Schmidt's is an attempt from Neusser's clinic to analyse the various painful sensations that occur in internal diseases, their mode of causation, and correct interpretation. The author discusses the manner in which they are affected by positions of the body, motion, pressure, the ingestion of food, remedial agents, functions of organs, their topography, and especially their relations to the different diseases and their diagnostic indications. In the first section the subject of pain in general, and of its occurrence in various regions of the

body, is set forth, while in the second each organ and organ-system is taken up at length, and detailed discussions are devoted to the pains accompanying the various diseases. We agree entirely that a reading of this volume will prove a revelation of the possibilities inherent in the careful analytical study of this single symptom, and that there is no department of medical practice to which its teaching cannot be applied with profit. We look upon this book as the most important which has appeared upon the subject since Hilton's "Rest and Pain."

A Text-book of Genito-urinary Diseases. By Dr. Leopold Casper, Professor in the University of Berlin. Translated by Chas. W. Bonney, B.L., M.D., assistant demonstrator of anatomy, Jefferson Medical College. Second edition, revised and enlarged. Philadelphia: P. Blakiston's Son & Co. Price, $5.00.

It is but three years since the first edition of Prof. Casper's text-book first appeared in English and was noticed in this Journal. To the very favorable criticism, which then appeared in these pages, it is perhaps unnecessary to add more than a further word of commendation. It is difficult, however, to let the occasion pass without remarking the completeness with which Prof. Casper has presented his subject: in every instance that long experience meets us, which adds so much weight to the resulting, carefully drawn conclusions, while the personal touch, which is to be found throughout, brings home many a fact a more elaborate if less impersonal work might fail to do.

The article on hypertrophy of the prostate is especially deserving of praise. It is short and complete and very conservative, though the author's personal experience with the newer radical operations is limited as compared with that seen in other fields. The chapter on gonorrhœal urethritis is one which has brought order out of chaos for many a student and will, we doubt not, continue to do so.

The author, as is almost self-evident, has personally gone over much of the translated work; small additions have been added by the editor, who has done his work thoroughly and well.

The book is but slightly enlarged though the material is somewhat rearranged, most notably in those sections dealing with chronic urethritis, cystoscopy and prostatic hypertrophy. One notices also an occasional new illustration. Altogether we can quite understand why the first edition is followed by a second at so early a date.

R. P. C.

Medical News.

MONTREAL GENERAL HOSPITAL.

At the annual meeting of the Montreal General Hospital the ordinary income was reported to be $101,818 and the current expenditure $128,909.

The total number of indoor patients treated to a conclusion was 3,087, or a decrease of 260 over the previous year. Of these, 188 remained over from last year, 3,103 were admitted during the year, and 204 remained in the hospital at the end of the year. There were discharged from the hospital 2,795, and there died in the hospital 292. The percentage of mortality was 9.4 or 4.8 exclusive of deaths occurring within three days of admission. The average number of patients in the wards per day was 200. The average number of days in the hospital per patient was 23.3, and the aggregate number of days in the hospital by all patients was 72,038, or an increase of 1,152 as compared with the previous year. The average daily cost per patient was $1.79.

The indoor patients treated to a conclusion numbered 3,087. In the out-patient department the total number of patients treated was 15,078, and the total number of consultations was 52,980. The treasurer stated that the committee of management intended to spend about $400,000 on the first part of the proposed changes. Towards this they hoped to be able to use the Alexander fund of $210,000, and the hospital's share of the receipts from the Orkney estate should value out about $100,000, making a total available amount of $300,000. It was thought that the committee could presume on the generosity of the people of Montreal for the remaining $100,000, and so proceed with a building clear of debt.

Twenty-two nurses graduated during 1908, bringing up the number to 331 who had passed through the training school since its establishment.

Officers elected were:—President, James Crathern; vice-president, H. Stikeman; treasurer, F. W. Evans; secretary, Dr. F. G. Finley.

Physicians—Drs. W. A. Molson, A. D. Blackader, F. G. Finley and H. A. Lafleur.

Surgeons—Drs. F. J. Shepherd, G. E. Armstrong, J. A. Hutchison and J. M. Elder.

Specialists—Oculist and aurist, Dr. G. H. Mathewson; gynæcologist, Dr. F. A. L. Lockhart; laryngologist, Dr. H. D. Hamilton; neurologist, Dr. D. A. Shirres.

The following having been nominated by the medical board for the outdoor department, and as assistant specialists, were appointed for one year:

Physicians—Drs. G. Gordon Campbell, S. Ridley Mackenzie, C. A. Peters, A. W. Gordon, A. G. Nicholls, A. C. P. Howard.

Surgeons—Drs. Kenneth Cameron, E. M. von Eberts, A. T. Bazin, A. R. Pennoyer, W. L. Barlow, R. P. Campbell, A. Mackenzie Forbes.

Specialists—Assistant oculist and aurist, Dr. S. H. McKee; assistant gynæcologist, Dr. H. M. Little; assistant laryngologist, Dr. R. H. Craig.

The following compose the committee of management:—Messrs. James Crathern, H. Stikeman, F. W. Evans, Dr. Shepherd, J. B. Learmont, David Morrice, James R. Wilson, Abner Kingman, Sir Hugh Graham, Sir Montagu Allan, Hugh Paton, Bartlett McLennan and George R. Hooper.

TYPHOID FEVER IN MONTREAL.

The authorities of the Montreal General, the Royal Victoria, and the Notre Dame Hospitals have addressed to the Board of Health the following communication:—

"The governors of the hospitals of this city desire to draw the attention of the City Council to the alarming prevalence of typhoid fever. During the recent epidemic, hospital accommodation has been insufficient to meet the demands for admission made by citizens suffering from this dread disease. Numbers of patients requiring treatment were turned away daily during its height. It is the duty of the city immediately to trace the cause of the outbreak and to take the necessary steps to prevent its recurrence, and to find means to alleviate the situation.

"The hospital authorities having been advised by the medical men of the city, and civil engineers, are convinced from the widespread character of the disease that impure water is the cause. Typhoid fever is a water-borne disease, and results from drinking contaminated water containing typhoid germs; when conveyed through milk, the milk has been contaminated by water containing the typhoid poison.

"Typhoid is a preventible disease, and should not become epidemic in any well-governed city.

"The proper filtration of water has in many other cities proved an efficient means of preventing typhoid, and some well-known system to bring about the desired result should receive your immediate consideration.

"The governors of the hospitals deem it their duty to present an urgent demand upon the Mayor and Council to take prompt action and protect the citizens against this scourge."

Retrospect of Current Literature.

SURGERY.

UNDER THE CHARGE OF DRS. ARMSTRONG, BARLOW, ARCHIBALD, AND CAMPBELL.

W. Simon. "The Experimental Study of Transverse Nephrotomy." *Beiträge zur Klin. Chir.*, Bd. LIX, Heft 2.

Simon, in this article, brings out certain points in the anatomy of the kidney with reference to the blood supply. These points he uses in order to strengthen his arguments in favour of the transverse nephrotomy. His anatomical work consisted in injecting, with a suspension of mercury, the arteries of the kidney and then having the organ skiagraphed. His findings were these: The renal artery divides into anterior and posterior branches; these again dividing so as to send branches into the lobules and on to the cortex.

Thus one has an arrangement by which there exists a considerable space, in which run no important vessels, lying between the two large main branches, anterior and posterior, and their ramifications; and this space runs longitudinally from pole to pole. Now it has been generally taught for a number of years that this longitudinal space lies a little posterior to the longitudinal mid-line of the dorsum of the kidney, and that in consequence the nephrotomy incision should be made a little posterior to the mid-line.

Simon finds that this view of things is somewhat erroneous; that the line of separation is situated in many cases exactly in the mid-line; and that in any case it is an extremely narrow one. Further injections showed him that with the usual longitudinal nephrotomy incision, large arterial branches were often cut, and, these being end arteries, large areas of the kidney were thus actually cut off from their blood supply, and were therefore functionally useless. Such considerations suggested the idea of the transverse as opposed to the longitudinal nephrotomy incision.

Next, he studied kidneys subjected to transverse nephrotomy and found the following:—A transverse incision could be made mid-way between the poles, commencing about 1 cm. on the posterior surface, passing across the dorsum and down into the pelvis on the anterior surface, without serious hæmorrhage or the cutting off of the blood supply to any large area of the kidney substance. This seems to be a considerable advance in the operation of nephrotomy, if one is to judge from his review, in the first part of this article, of the work of the older surgeons who have used the longitudinal incision: many of these, as well as himself, have come to the conclusion that the old operation is not as conservative as used to be generally considered, and this because of the frequency of

large anæmic infarcts and of serious, even fatal, secondary hæmorrhage. There have been already a few cases operated on by this method with very slight hæmorrhage and no untoward consequences.

The essence of this article, therefore, lies in this, that the transverse method on the one hand offers less danger of hæmorrhage than the longitudinal, and on the other an equally good exposure of the kidney pelvis.

W. H.

MEDICINE.

UNDER THE CHARGE OF DRS. FINLEY, LAFLEUR, HAMILTON, AND HOWARD.

THE THYROID GLAND.

In the matter of simple goitre, it has long been known that the disease was local or endemic, but just what was the offending cause has led to no small speculation.

An interesting communication dealing with this question came from Captain McCarrison of the I. M. S., in 1906, upon the occurrence of goitre in the Chitral and Gilgit valleys on the northwestern frontier of India.

In the Chitral district the water supply comes from springs fed by melting snow. In the notoriously goitrous portions of the district the water passes through a limestone formation. In these districts goitre was very frequent among young children as well as adults. Seventeen Hindus—members of the expedition, from non-goitrous regions of India, after four months residence developed enlargement of the thyroid.

In the Gilgit valley, goitre was found in all of the villages but one. In this one, the water supply was from a source different from the others, though analysis of the two waters gave practically the same result.

A point of interest exists in reference to a village called Nagar. This village was closed to outsiders until a sharp frontier "little war" in 1893. Before this no cases of goitre had occurred in the village. After the unpleasantness, three persons came from Gilgit with goitre and inside of two years four others in the same house developed enlarged thyroids. In another house one member of the family brought home a goitre and later two others in the same house contracted the disease.

The first family lived at the head of the village water supply, and during McCarrison's stay, 12 children in different parts of the village were brought to him with goitre.

From these facts he suggests the probability of goitre being infective and the infecting agent thriving best in a lime-containing water. Charlton's observations on the goitre-bearing areas in the Montreal dis-

trict, made in 1901, showed that on the island of Montreal, simple goitre was found in a percentage of the inhabitants from 1.5 in the east at Pointe-au-Trembles, to 7 at Ste. Anne's, a steady increase occurring in a westerly direction along the river front, excluding the city proper. In the central parishes of St. Laurent and Sault-au-Recollet it was almost absent. He found that where it was least common, the water supply was from deep wells tapping blue clay; where most common, it was from more superficial wells in sandy soil. At Pointe-aux-Trembles, when well water was used, the incidence was 4%; since the installation of a municipal river supply it had dropped to 1.5.

There is now no necessity of stating that myxœdema is due to an absence of the thyroid secretion, but it is interesting to note that MacCallum and Fabyan, in an autopsy lately on the body of a myxœdematous idiot, found the thyroid glands represented by small fibrous nodules with only a suggestion of proper thyroid tissue. On the other hand, to indicate that the matter is not monotonously simple, Samuel West, among others, reports the onset of an acute myxœdema in the course of exophthalmic goitre.

In the matter of the ultimate causation of Basedow's disease there is not much to be said, no one theory having a safer standing ground than another. That its immediate cause lies in the thyroid gland there is now but little question, though from this point another division of views takes place, namely:—(a) That its manifestations arise from a metabolic poison unhampered by an insufficient or inert thyroid secretion; or, (b) that the production of thyroid substance has run riot and itself acts as a body poison. The first theory has some support from the observation of Hunt, who found that mice fed on thyroids were able to stand larger doses of acetonitrile without fatal effect than controls. Blum held that a toxic globulin arising in the course of metabolism was detoxicated in the thyroid by chemical combination with the iodin, and that therefore the colloid was an excretion, and the more perfectly iodized it was the less toxic it became. This theory he based upon the observation that thyreoglobulin lost its physiological properties when iodine was added to it; but if followed to its conclusion, this view would contradict the fact that physiologically active thyreoglobulin does contain iodine, and more, that its activity is in proportion to its content of iodine. Oswald's chemical studies of goitres showed an excess of globulin poor in iodine, and Beebe found in exophthalmic goitres a very great increase in the nucleoproteid as compared with normal glands; in the fatal cases, this increase was excessive. The hypersecretion theory has these facts in its support, as also the well known appearance of individual signs of Basedow's disease

after thyroid feeding; though it must be said that so far, the complete clinical picture has not been reproduced by this means.

An instructive case in this connection is reported by Matthes, who removed a thyroid from a patient suffering from exophthalmic goitre with a curative result, and then fed to him his own dried gland with return of his old symptoms. But if hypersecretion be the cause,—why the hypersecretion? Pawlow's work upon the digestive glands and their change of function from psychic causes, gives colour to the idea that it may be of nervous origin.

"Did the hen come first or the egg?" Is the goitre nervous or is the nervousness goitrous? It seems most likely the latter.

Another reasonable supposition is that the altered secretion of the gland has been brought about by an acute infection. In favour of this are Gilman Thompson's 80 cases in which forty had recently tonsillitis, influenza, or other acute febrile illness.

There have been long recognized four cardinal signs of Basedow's disease, beside a number of accessory ones.

First, the goitre, which is almost always present, and is also nearly always vascular, giving pulsation, thrill and murmur on examination: its surface as a rule is apparently granular to the touch.

Second, tachycardia, which is perhaps, the most important and most constant sign. It is not only a sign of the disease, but the degree is an indication of its severity.

It is probably due to direct sympathetic cardiac stimulation, as the blood pressure is as a rule higher than normal.

Third, exophthalmos, which is said by Barker to be absent in one-third of the cases. It is much the most obvious sign on casual inspection. Early in its course it may be reduced by the finger temporarily, but later this is impossible. In fact, as Möbius states, a "fat pillow" is found behind the eyeball in late cases, which would indicate an organic adaptation to its presence.

Fourth, tremor, which is fine and rapid, not increased by voluntary motion, but is increased by excitement.

In this connection one might mention the greatly diminished muscular power—about one-fifth of the normal, and also the observation of Shaffer that the kreatinin output is greatly lessened, the latter possibly being associated with diminished muscular metabolism. In comparison with this we have the greatly increased output of total nitrogen and phosphates, which facts go hand in hand with the rapid and severe emaciation characteristic of the disease.

The ocular signs aside from exophthalmos have been much described and much named. Of these, Stellwag's sign, the widening of the palpebral fissure, is the most valuable. Möbius states that it is the earliest sign to appear and is never completely absent. It may be present on only one side, and may vary from time to time. He states also that a strip of uncovered conjunctiva above the iris is always pathological. The other ocular signs may be simply mentioned:—Von Graefe's, failure of the upper lid to follow the eye ball; Stellwag and Dalrymple's, retraction of the upper lid on straight vision; Stellwag's, incomplete winking; Giffard's, difficult eversion of the upper lid; Jalinek and Rosin, pigmentation of the upper lid; Joffroy's, failure of the forehead to wrinkle; Möbius', insufficiency of convergence. Möbius states that internal ophthalmoplegia does not occur, but explains the sign called by his name as a weakness of the external muscles.

One is struck by the resemblance of the eye signs of Grave's disease, except for the state of the pupil to the results after stimulation of the sympathetic in an animal. In a bird there follow protrusion of the eyeball, retraction of the nictitating membrane, widening of the palpebral fissure, and dilatation of the pupil—all and sundry an apparent demand for more light.

Fever is often present to a slight degree, but Thompson has laid stress on what he terms an acute form of the disease simulating an acute septicæmia. I quote his report of such a case:

"A woman of 29 entered the hospital with the following history:—She had been in good health up to six weeks previously, never having noted any goitrous symptoms. At that time she had a severe cold and cough, became extremely nervous and restless, and complained of violent palpitation. Two weeks later she noticed that her neck was much swollen, and there were marked tremor of the hands, abdominal pains and œdema of the legs. On admission there was no exophthalmos, but there was a large soft pulsating goitre with a thrill and bruit. The heart apex was five inches from the midsternum, with loud systolic murmurs at apex and base. There was a leucocytosis of 20,000. Sweating was active, vomiting frequent, and the tongue dry and red. There was much abdominal pain. For ten days the temperature ranged from 101 to 104, the maximum pulse rate was 144. Theere was marked dyspnœa without any pulmonary lesion. Insomnia was constant; jactitation, mental distress and complaint of excessive pulsations in the neck were painful to witness. The legs were greatly swollen with a tense œdema, a smooth shining skin with extensive erythema. This, with fever,

leucocytosis, and sweating and the typical appearance of a general infection led me to call upon a surgeon for advice as to free incision. I fortunately decided to postpone the procedure and became more and more convinced that the case was one of unusually acute Grave's disease. The subsequent history and the complete cure under the Rogers-Beebe serum proved the correctness of the diagnosis." Such cases one would think must be rare.

In the treatment of Basedow's disease, there are few drugs in the pharmacopæia which have not had their turn. Looking at the number used on this side of the water, Möbius says: "America must be an Eldorado for the apothecary." He, himself, on the recommendation of Sahli and Kocher, has made use of sodium phosphate 2-10 grm. per diem with satisfactory symptomatic results. As to iodine, he states that he teaches his patients, "Iodine is poison for you." Forcheimer has for a long time made use of quinine hydrobromate gr. 5, thrice daily, over long periods and is so pleased with his results that he continues using it. The use of static electricity and the x-ray have had their advocates, and especially the latter has shown in some cases a diminution in size of the goitre with some amelioration of the symptoms. The most hopeful form of medical treatment has been that by some form of serum.

Broadly speaking, this method has been followed along two lines: First, an "antitoxic" serum, which had its origin in the supposition that the thyroid was producing too much of the substance normally employed in neutralizing the toxic globulins of metabolism. Myxœdema being the antithesis of exophthalmic goitre, blood from a myxœdematous patient was injected into a Grave's disease patient with apparently beneficial result. Enriquez and Ballet, in 1895, then used serum from dogs, whose thyroids had been removed, also with favourable results. Lanz, in 1899, used the milk of thyroidectomized goats. Möbius, in 1901, used the serum of sheep treated similarly, in doses by the mouth of 10-30 minims three times a day. Writing in 1906, he still considers that this is the most satisfactory form of treatment yet brought forward; a fair proportion of his patients were cured and a number improved, but in some there was no effect. Second, Rogers and Beebe proceeded along the line of producing a cytolytic serum. This they produced by extracting from thyroid glands (preferably of exophthalmic goitres removed at operation), the nucleo proteids and thyroglobulin, injecting these into rabbits and using the rabbit serum for human injection. They tested the cytolytic serum by agglutination with an emulsion of thyroid gland. The object in using both nucleoproteid and thyreoglobulin, is that the former

produces the cytolytic agent which inhibits the production of poison by the gland cells of the thyroid, while the latter stimulates the production of a direct antitoxin. This serum was found much more efficient in acute cases than in more chronic ones.

In September, 1906, Rogers reported having personally treated 55 cases, of whom 20 were cured of all symptoms of thyroidism, 24 were improved; 7 failed to show benefit and 4 died.

A. H. G.

PATHOLOGY.

UNDER THE CHARGE OF DRS. ADAMI, KLOTZ, AND NICHOLLS.

THE THYROID GLAND.

Abnormalities of development of the thyroid are frequent and these can in almost all cases be traced to a persistence of the fœtal stricture in part. Such are the small thyroid to be found at the base of the tongue, the small collections of fluid with occasionally solid masses that develop in the median line at or just below the hyoid bone due to a persistence of the thyroglossal duct with at times a small portion of attached thyroid. Portions of the thyroid are frequently found misplaced, that is, they may occur outside the capsule of the gland proper and even further removed as in the thymus or other structure of the neck or mediastinum. Occasionally a marked enlargement of the gland occurs in fœtal life and hinders birth. Complete absence of the thyroid is almost certainly incompatible with life and is therefore never seen, while over-development is thought to be always due to some disturbance of the gland function.

The thyroid gland may be the site of any of the inflammatory processes met with in the body, such as syphilis, tuberculosis and typhoid or pyæmic abscess. Very rarely the thyroid has shown temporary enlargement during an attack of mumps.

Changes in the thyroid gland are seen in two or at the most three diseases that appear to affect the body very widely, but the relationship of the alterations of the gland to these diseases is by no means clear. We will first consider that disease where the secretion of the normal thyroid is supposed to be insufficient for the body needs, chiefly because a supply of extraneous thyroid to that body proves beneficial.

This disease, that in its slighter form appears as myxœdema and in its severe form as cretinism may be endemic or sporadic, and is supposed to be due to a toxin in the water supply affecting most severely a weakened system. It is almost always associated with macroscopic and microscopic changes in the thyroid. In endemic cretinism the gland is

usually enlarged, and a study of its minute structure shows that the gland acini are widely dilated and filled with colloid material. There appears to be a formation of new glands and the stroma is marked and often shows a myomatous change. This condition of the thyroid is known as colloid struma or as parenchymatous degeneration of the thyroid. Again in these cases of endemic cretinism or myxœdema the gland may be atrophied and the vesicles are few and small, while the stroma is markedly increased.

This is the condition of the gland usually seen in the case of the so-called sporadic cretinism or myxœdema, and very rarely the gland appear to be entirely absent.

We now come to the second special disease that is supposed to depend upon an increase of the thyroid function, beyond the body need, Graves' or Basedow's disease, also often termed exophthalmic goitre. In this disease, as can be understood from the last mentioned name, the thyroid is almost always enlarged; but still a few cases are on record where the gland remained of normal size, and there are even a few cases of Graves' disease in old persons where the gland, as would be expected from normal involution, was atrophied or even absent.

MacCallum, Lubarsch and many others hold that in true Graves' disease, the thyroid is always enlarged and that the minute structure of the gland in part or whole will show definite and constant changes which are as follows: the gland lumen is usually dilated and often tubular or convoluted. There is an absence or diminution of the stainable colloid. The lining epithelium tends to change from cubical to tall columnar often with papillary-like projections into the lumen. There is an increased vascularity and an increase in the fibrous stroma with numerous areas of small celled infiltrations. These changes are found, however, only in those cases of Graves' disease that occur in young people from about 14 to 30 years of age, where the toxic symptoms and the enlargement of the thyroid have occurred at one and the same time. At times the enlargement of the thyroid has antedated the toxic symptoms and here the gland shows dilated acini filled with stainable colloid and lined by flattened or cubical cells. Here the general disease is supposed by some to be secondary to the enlarged thyroid. At times in the thyroid in these, small areas are found showing the epithelial hyperplasia described as occurring in the typical cases. Dock thinks the enlarged thyroid will always show these areas if it is searched carefully enough, but the weight of evidence appears to be against him. Again, where a thyroid adenoma has been present for a long period, the toxic symptoms of Graves' disease may develop and the excised gland may

show no change other than the presence of the above tumor. Again a hæmorrhage into an otherwise unaltered gland or into a gland showing colloid degeneration or into an adenoma of the thyroid, appears to cause the onset of Graves' disease. Again patients who die with the severe symptoms of Graves' disease may show perfectly normal thyroids, and occasionally in old persons who died with this disease, the thyroid tissue may be completely absent, and lastly hyperplastic changes of the thyroid as described by MacCallum to be met with in Graves' disease may, as pointed out by Kocher, be found in excised thyroids where there was not a single toxic manifestation. From the above one can easily see that Graves' disease has not an approximately constantly altered thyroid.

The parathyroids in cases of Graves' disease are usually unaltered, but at times show extensive fatty infiltration of the stroma. The thymus is also occasionally found persistent and enlarged and often contributes markedly to a lethal termination.

As Graves' disease is supposed to be connected with disturbance of functions of the thyroid so tetany is supposed to be due to diminution or absence of function of the parathyroids. From their small size and also from the difficulty in finding them, the parathyroids have been relatively rarely studied from a histological standpoint.

Their supposed connection with tetany rests mainly on the fact that very occasionally after complete extirpation of the thyroid, tetany has developed. This is supposed to be due to removal of these glands or to interference with their blood supply. Gley and MacCallum found that if the parathyroids are removed in animals, tetany develops, while Vincent and Joly state that this is not so; and Forsyth, the latest investigator, states that the parathyroids are really thyroidal in nature, have no special function, and are not essential to life.

Other observers state that the parathyroids are related to calcium metabolism, and when tetany occurs as it often does in cases of lactation or rickets or osteomalacia where a disturbance of calcium metabolism is suspected, the glands show change from aplasia to atrophy. This view is not generally accepted.

The thyroid gland may be the site of tumors which may take origin from any of the cells of this structure and may show any degree of reversion to a fœtal type. The most frequent tumor is the well known adenoma of the thyroid which may be single or multiple. Apparently at times adenomata that are benign as far as one can judge from the sections may give rise to metastatic tumors which seem to have a special predilection for bones. These thyroid tumors in bones have been found when there was no tumor of any kind in the thyroid and are then supposed to spring from foci of misplaced thyroid tissue.

These metastases have apparently the power of performing the usual function of thyroid cells, but apparently never give rise to the toxic symptoms of Graves' disease.

Tumors arising from parathyroid cells have been described, both from the parathyroid glands, and from parathyroid cell groups misplaced in the thyroid gland as they frequently are. These are characterized by the presence of the three types of cells met with in these glands, that is large, clear, fat—and glycogen—containing cells with small round nuclei, large oxyphile cells with eccentric small round nuclei where the cytoplasm shows eosinophile granulations and lastly multinucleate cells.

C. B. K.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The sixth regular meeting of the Society was held Friday evening, December 18th, 1908, Dr. J. M. Elder occupied the Chair in the absence of the president.

PATHOLOGICAL SPECIMENS.—HEART DISEASE.—TYPHOIDAL LESION IN A MECKEL'S DIVERTICULUM.

Oskar Klotz, M.D. The first three specimens that I shall show you illustrate three types of heart disease, occurring at different ages.

The first specimen is the heart of an infant, one month and sixteen days old, in which an acute septic aortic endocarditis is found, affecting particularly one valve. This valve, the anterior cusp, has its aortic surface and the sinus of Valsalva almost completely covered with fresh exudate, from which streptococci were obtained. This was the only lesion in the heart.

In this case, the heart only served as a secondary distributing point of infective material. The primary site of infection was found in a suppurative middle ear, from which the same organisms were obtained. The heart lesion can thus be considered to be only one of the manifestations of a septicæmia.

The second specimen is that taken from a man of forty-five years, who, on the day previous to his death, was transacting his usual business. During that day, however, he developed anginal attacks which continued with increasing frequency for the next twenty hours. He sought the Hospital for treatment, but died shortly after reaching it. The autopsy disclosed an interesting and rather unusual lesion in the nature of a small and recent pedunculated thrombus attached to the

upper margin of the anterior coronary orifice. This thrombus was in such a position that every now and again the blood pressure forced it into the mouth of the coronary artery. The fatal turn resulted from the thrombus being forced into the mouth of the anterior coronary, and not being relieved by the subsequent pulsations. The coronary arteries of the heart, as also the aorta of this man, were in relatively good condition, while the heart valves too showed little change. Just why this small and recent thrombus found its origin at the mouth of the coronary artery is difficult to explain.

The third heart specimen was obtained from a man aged thirty-four. He had been a sufferer of heart disease, possibly a rheumatic, for some time. The particular lesion of this heart is also located on the aortic valve. Here I find evidence of old sclerotic processes with fusion of the heart cusps, while there is also a recent and progressive ulcerative process of the valves. The anterior cusp is remarkably thickened by the deposit of organizing exudate. Besides this, we find attached to this valve a long ribbon-like thrombus extending freely into the aorta. When the specimen was obtained, this thrombus was floating freely in the blood of the aorta. The length of the thrombus is rather unusual, having been in the fresh heart 8 cm.

The last specimen is part of the intestinal tract, taken from a patient suffering from typhoid fever. Typhoidal ulcers were met with in the large and small intestine, the appendix and the rectum, but more unusual than this, was the presence of typhoidal lesions in a Meckel's diverticulum, whose perforation had led to peritonitis and death. The ulcers in the small bowel were of the usual appearance seen at the end of three weeks' illness. The ulcers, however, immediately before the ileo cæcal valve were extensive and had led to severe hæmorrhage. The Meckel's diverticulum was situated 40 cm. from the valve, and itself was 9 cm. in length. The diverticulum had its own mesentery, but was not attached to the umbilicus. It was roughly divided into two portions: the proximal portion communicated freely with the intestine and its mucosal lining was very similar to that of the ileum. The distal portion was separated from the proximal by a constriction giving it an hour-glass appearance. The distal part was globular and contained fluid, while its lumen did not communicate freely with the other portion. The distal part was lined by a necrotic membrane, in which the mucosa had been entirely destroyed. There were several deep ulcers through it, which allowed leakage of the contents. It is probable that the original shape of the diverticulum was hour-glass, and that the inflammatory swelling of the bowel led to a closure between the proximal and distal portions of the

diverticulum, thus converting the distal portion into an infected sac.

W. F. Hamilton, M.D. The third cardiac specimen is of peculiar interest from a clinical standpoint inasmuch as one feature, to me at least, was entirely exceptional. The patient came into hospital for treatment of a very marked acute hæmorrhagic nephritis, and, in the examination of his circulatory system, the first thing that struck me was the peculiar second beat or wave in the pulse which impressed itself upon the finger. A second wave we are all accustomed to feel more or less frequently in typhoid fever, but it is rather remarkable to have this dicrotism in this condition. In this case we were led to look a little further into the case and analyse it by the aid of tracings which Dr. Moffatt made for me. Not only could one feel this second beat in the distal arteries, but one could see distinctly in the carotids a distinct second jog. In analysing that under the finger one thought it is not like dicrotism, because it comes too close to the summit of the wave, and I was thus nonplussed to make a decision concerning it. Looking up MacKenzie, he says that such pulses are instrumental, but here it was certainly not instrumental and we have concluded that it was an unusual second wave corresponding to the so-called systolic, predicrotic or elastic wave which appears to be found most frequently in aortic regurgitation with stenosis. We therefore go back to what some physiologists teach that the heart muscle in its systole consists of two distinct efforts, the first when the muscle tackles the load and the second when it accomplishes its effort. It would appear therefore to be an unusually high predicrotic wave occurring in systole, and associated with a very marked disproportion between the muscle of the heart and the load it had to bear. The blood pressure was from 130 to 145. The second case of angina is that definitely associated with what was taught many years ago, namely ischæmia of the heart muscle.

Ridley MacKenzie, M.D. I am glad to hear the case of thrombus in the coronary vessel. I think this condition explains a case I had of repeated attacks of intense dyspnœa which passed off after a time. There were about six attacks in all and the only explanation I could think of at the time was the infarcts of the lung. The heart was not much enlarged and though blood pressure was high, angina pectoris did not account for the attacks—the specimen here presented gives an explanation of the attacks, which in my case eventually caused the patient's death.

J. M. Elder, M.D. I understood Dr. Klotz to say that he thought that the diverticulum had been always probably of the "dumbbell" or "hour-glass" shape. I should like to ask Dr. Klotz if, in his post-

mortem examinations, he has ever found diverticula of this particular shape? My own experience of diverticula was largely got from the dissecting room, and I cannot remember having seen there any of such shape. That a diverticulum should have become ulcerated in typhoid is, I fancy, what has occurred before.

Dr. Gurd: I would like to ask Dr. Klotz if it is not a rather unusual place for a Meckel's diverticulum to occur.

Oskar Klotz, M.D. In regard to the Chairman's question I may say that I do not remember having seen an hour-glass Meckel's diverticulum before, the nearest approach to this which I have seen was a Meckel's with an attachment to the umbilicus and along which occurred a little sac, entirely separated from the Meckel's itself, but containing mucous membrane within it. It did not form a true hour-glass organ, in that the communication between the Meckel's and the sac was obliterated.

As Dr. Gurd points out it is unusual to have a Meckel's diverticulum arising so far to the side of the bowel. On the other hand, the falciform mesentery attached to the diverticulum, rather than opposing the view that this is a true Meckel's, suggests it. Every Meckel's has a main blood supply along one side, and the blood vessels are usually in a more or less marked mesentery. On the other hand, the diverticula occurring along the mesenteric border of attachment of the bowel consist of small sacs, without such a definite blood supply to them. These latter diverticula are usually of the nature of small hernias of one or more coats of the bowel.

THE CHEMISTRY OF THE URINE IN DIABETES MELLITUS.

C. P. Howard, M. D.

W. F. Hamilton, M.D. I have been a member of this Society for many years and this is the first paper of this kind, and it speaks of the nearness of touch we are gaining to the laboratory, and at the same time it speaks for the kind of men we are gathering round us who do such laborious and careful work as this. I have been very much interested in diabetes and during the last year have treated three cases which came directly under my notice, but in only one instance did I have such a severe case as this. In three instances I was able by careful grading of the carbohydrate content of the food to arrive at a tolerance for that element of the food and in two cases a fair amount was borne, that is an amount in which the patient could do work and be confortable. In one case the subsequent history showed a very pronounced glycosuria. He was a clergyman, passing 4 per cent., who had recently fallen ill with all the signs of diabetes. In 6 to 8 weeks we are able to get him free from

sugar and to tolerate 1 to 2 potatoes, some egg and a little toast. He went abroad and returned after several months; on the resumption of his duties his physician finds that he is again passing sugar. It appeared to me that he belonged to the light cases and one that would do well under ordinary circumstances with a light diet. I never saw coma in diabetes begin without ending fatally or even threaten without it went on to death. I have tried the bicarbonate of soda and have given the patient for weeks at a time from three to four hundred grains a day and yet in the midst of this she lapsed quickly into a coma and died.

F. M. Fry, M.D. I would like to add my gratitude to Dr. Howard for bringing before us such painstaking work. I was hoping that he would emphasize that we have to deal, roughly, with two kinds of patients, 1. the one who is well past middle age and stout, and 2. the patient who is young (about the age of Dr. Howard's), and thin. Our forefathers knew perfectly well that the prognosis in the former is favourable; we all know, too, that the prognosis in the lean class of patients is very grave. As to tests for acidosis: we have in Legal's test a delicate means of recognizing the first note of warning—the presence of acetone in the urine. The test (sodium nitroprusside and ammonia) can be carried out in a minute's time and I am accustomed to use it in a busy out-door department where more elaborate and quantitive tests are impossible.

H. M. Little, M.D. In looking over the figures of Dr. Howard, I find that in three or four instances a low output of urine was accompanied by a high specific gravity, and a high specific gravity has a low output of sugar. I would like to ask what may be drawn from this.

C. P. Howard, M.D. As regards the question as to the various methods for ammonia. The one that I used was at that time the best one available, viz: von Schlössing's method, which is rather an elaborate one and requires three to four days before one can get one's result. However, as Dr. Gilday no doubt knows, Folin, of Boston, has introduced a much more accurate method and one which takes but a few hours instead of a few days. At that time I had no experience with the method, but since then I can get very accurate results. It depends upon the driving off of the ammonia by means of an air current and collecting it in a decinormal hydrochloric acid solution. It is a method which can be recommended to all and is the simpler one. As regards Dr. Hamilton's remarks, this case was a very severe one and was taken on this account; for my purpose was not to see the benefits but rather to watch the chemistry of a severe case. The object of any dietry is to increase the carbohydrate tolerance. Many cases will never be free of the glycosuria, but many will have their carbohydrate tolerance increased and the import-

ance of that can best be realized by saying that the carbohydrates are the saving factor. If one can do this one lessens the chances of coma. This will answer Dr. Peter's remarks that it is not practical for a man in ordinary practice to do this hospital routine: but I would say watch rather your acetone than your sugar, the sugar, authorities now believe, is of less importance than the acetone. When you have a low sugar output, as for instance in the last stages of diabetic coma, you may have a very high acetone output, which is the real danger point and not the sugar that is being lost. The percentage of the sugar is of absolutely no importance as compared with the amount in the 24 hours. A clinician who satisfies himself with reading the percentage of sugar and not knowing the amount in the 24 hours, is wasting his time and is falsely scientific, because the amount of sugar varies considerably. The percentage may improve and the sugar may increase. Hence, if you only take the reading of the percentage of sugar you are no wiser, in fact you are probably misled. As to Dr. Hamilton's remark of never having seen a case of diabetic coma, or even threatening coma, recover: this is in part quite true. In my own case coma was threatening several times, that is she became drowsy and the urine showed then an increased acidosis. In these cases clinicians have got improvement with large doses of sodium bicarbonate, but when the coma has once become established, as in the three cases I have attended, this has had no benefit. But, I feel that we use the alkalies too late and then in not heroic enough doses. It should be given intravenously; there is no use dallying with subcutaneous or rectal injections and 1 litre or 1500 cc. in as brief a time as possible should be given. Of course, this is not a clinical paper and I could not pretend to discuss the clinical aspect of the whole subject. As to the practical test mentioned by Dr. Fry I did not discuss the qualitative tests but only the quantitative ones.

DREAMY STATE WITH TUMOUR OF THE TEMPORO-SPHENOIDAL LOBE.

C. K. Russell, M.D. This case report appears on page 75 of the February Journal.

E. W. Archibald, M.D. Dr. Russel referred the case to me for operation and I first did a decompressive operation intended as the first stage of the radical operation. It was hoped that the decompression might accomplish something for her very severe neuralgia. At the second operation, which was undertaken on account of no relief to the neuralgia, I had my finger practically into the middle line and palpated the whole tempro-sphenoidal lobe upwards, but I could feel no growth. It is very

instructive, looking back now in the light of the autopsy, to find that the tumor was really larger than had been expected. As it looks now from the specimen you could imagine it a very easy matter to palpate, yet it was impossible to detect it. It is very difficult, except with certain kinds of tumor, to palpate in this region. There is no possibility of doing bimanual palpation, and it is only bimanually that one can actually feel a tumor in this position, unless it be especially resistant. This was an irremovable tumor by virtue of the fact that it had penetrated the base of the skull. As to the point mentioned concerning the diagnosis of these lesions by auræ of taste or odour, referable of course to a lesion of the uncinate gyrus, I remember one case where a spicule of bone had deeply penetrated the temporal lobe in which the cardinal symptom of the fits was that they were ushered in by a foul taste in the mouth.

C. K. Russel, M.D. With regard to the fits I would say that auræ of smell and taste are not uncommon as evidence of lesions in the uncinate gyrus and are often associated with these dreamy states, but it is just these latter that I wish to emphasize to-night as of localising value in tumors of the temporo-sphenoidal lobe.

PYELO-NEPHRITIS COMPLICATING PREGNANCY.

D. J. Evans, M.D.

E. W. Archibald, M.D. I think Dr. Evans is to be congratulated on presenting such an admirable paper. The general surgeon sometimes comes across these cases and may be much puzzled by them. I have had three cases of pyelonephritis with abscess in women, of whom two were pregnant, the first being in the very early months and the second in the sixth month. The last was a very severe case, but got well. Two were referred to me with the diagnosis of appendicitis, because of the pain in the right flank. They are extremely important cases, I think, for that one reason, that it is very necessary for the general surgeon or practitioner to distinguish them from appendicitis.

R. P. Campbell, M.D. It is some time since I saw these cases and I can only vouch that they were undoubted cases of pyelo-nephritis. There is some doubt as to the manner of infection in all these cases; that it is an ascending infection in the urinary tract always seems to me to be open to question. Experimentally it is practically impossible without the additional factor of urethral obstruction, hence pyelo-nephritis in women is a rare event. The nature of the infection is an extremely interesting point, in most of my cases it was the bacillus coli. This, I think, must be far the most common cause and it seems to me it must come from the gastro-intestinal tract through the blood, though a direct

passage from the bowel to the kidney is perhaps possible. I was interested to hear that the gonococcus was found in a case of pyelo-nephritis; I have tried to discover cases in the literature where the kidney was infected by this organism. It has never been found to my knowledge in smears or in culture, either in the kidney or pelvis itself.

J. M. Elder, M.D. I cannot, from a practical surgical standpoint, agree with the opinion that this condition can possibly be due to the occlusion of the ureter by pressure. One must have some other etiological factor associated with pressure. My reason for such opinion it that it is well known in surgical literature that a complete occlusion of the ureter has another effect, viz: to produce an acute hydronephrosis and secondarily complete atrophy of the kidney. It has occurred quite frequently, in operating, that the ureters have been ligated by mistake, and the above has been the result. I do not think, therefore, that occlusion of the ureter alone will be sufficient: there has to be some added infection; and I think that an ascending infection is not an uncommon cause of pyelonephritis. That would exploit, to some extent, the ingenious theory of the Frenchman, namely, that if you occlude the ureter and produce thereby an acute hydronephrosis, then you would expect, if the bacillus coli got through, to get a pyelonephritis. I should think a certain amount of pyelonephritis in a woman, pregnant or otherwise, might be due to temporary occlusion of the ureter by a calculus.

D. J. Evans, M.D. I think there was no doubt of the diagnosis in the cases I have reported though only one of them could be verified by autopsy.

When a woman late in pregnancy complains of pain and tenderness over McBurney's point it is very much more likely to result from pyelonephritis than from appendicitis. To clear up the diagnosis in such cases, the urine should be carefully examined daily for at least four days before pyelitis is excluded.

The bacillus coli is extraordinarily prominent as the infective agent in these cases. In an overwhelming proportion of those cases examined bacteriologically this has been the infecting organism.

In my own experience in every single case of pyelonephritis that I have seen, there has been more or less abnormal vaginal discharge. Two or three of my cases complained of irritable bladders, some days before any evidence of nephritis developed. These two facts have led me to rather favour the view that the condition present in my cases resulted from an ascending affection.

In reply to Dr. Campbell's question as to my authority for the presence of gonococcus in the kidney, I may say that I have simply stated that

these among other organisms are stated to give rise to the condition.

In regard to dilitation of the ureters in consequence of pressure of the uterus during pregnancy I know, as Dr. Elder has said, that recent writers tend to oppose this theory, but again my own personal experience must affect my opinion, because I have seen several post-mortems on women who have died from accidental causes during advanced pregnancy, in whom there has been most marked hydronephrosis, and always on the right side. Another thing that may account for the tendency for this condition to be associated with the right kidney is that possibly pyelonephritis in pregnancy is the result of twisting of the ureter occurring in women who are the subjects of "floating kidney." This combination of causes, pregnancy, plus floating kidney, probably act by reducing the resistance of the ureter and pelvis of the kidney on that side and thus favour the infection by the colon bacillus.

The seventh regular meeting of the Society was held Friday evening, January 8th, 1909, Dr. J. Alex. Hutchison, President, in the Chair.

Dr. G. E. Armstrong read the report of the committee appointed to look into the question of the water supply to the City of Montreal.

This report was adopted after discussion by Drs. Shepherd, Roddick, England and the President. It was resolved that a copy be sent to the press and that the committee of this Society be asked to act in conjunction with any committees of other societies which may be appointed to take up this particular question with a view to interviewing the civic authorities and demanding a better water supply.

ABSCESS AND GANGRENE OF THE LUNG.

G. E. Armstrong, M.D., read the paper of the evening. This will be found on page 83 of the February number of the Journal.

F. J. Shepherd, M.D. Dr. Armstrong is to be congratulated on the excellence of his paper. He has left us very little to say on this subject. I remember the first case I saw was one following excision of the tongue many years ago, the patient rapidly dying of gangrene of the lung. There was a post-mortem and the gangrene was found to be confined to one lobe. I have seen quite a number of cases since; one I mistook for a localised empyema with adhesion of the parietal pleura. With regard to the fact that foreign bodies sometimes cause these I remember one case where one of our graduates swallowed a piece of nut shell and finally died from an abscess formed from this foreign body. Another such case was in the hospital lately, but here the foreign body was coughed up.

J. Alex. Hutchison, M.D. I would like to add in conclusion that no case would appear too advanced to have one hope for a successful result. I had a case a few years ago where the patient was almost unconscious. He had been advised not to submit to any operation and his friends were also against any operative interference, though his family physician and myself had advised it for some time. Against this opposition, however, we opened the cavity and drained it without an anæsthetic as the patient was unconscious, and the case made an uninterrupted recovery. This would show that the gravity of any particular case should not prevent one endeavouring to drain the cavity just like an abscess elsewhere. We are all indebted to Dr. Armstrong for his excellent paper.

E. Hamilton White, M.D. I was much interested in Dr. Armstrong's reference to foreign bodies as the etiological factor of importance in some of these cases. Such cases furnish a very important field for the use of bronchoscopy, both as a means of diagnosis and in suitable cases for treatment: Professor Killian reported a case last year which illustrated some important points. The patient had had symptoms of a chronic lung abscess for five years. No history pointing to foreign body aspiration was obtained until after an X-ray showed a nail in one of the bronchi. It was then explained that the man was an epileptic and had once taken a seizure while at work with some nails in his mouth. The case presented special difficulty owing to a stenosis of the bronchus above the foreign body. The nail was removed by means of the bronchoscope and the result very good. I had an opportunity of seeing a case in Siebenmann's clinic where the symptoms were somewhat similar and with a history of aspiration of a piece of nutshell some four of five years before. A thorough examination with the bronchoscope failed to reveal any foreign body. The case was operated on later by a surgeon, but he also failed to locate any foreign body.

G. E. Armstrong, M.D. Dr. Shepherd's remarks recall a case that was really of great interest, one which Dr. Molson and Dr. Gordon sent over from the medical side with a diagnosis of pulmonary abscess. The diagnosis seemed to be pretty definitely made with the aspirating needle which brought away a small quantity of pus. On opening into this area, I came into a space which I was subsequently able to define pretty distinctly as situated between the middle and lower lobes of the lung on the left side, the space containing a small quantity of sero-purulent matter, perhaps a couple of ounces. The abscess was not, strictly speaking, within the lung and therefore was hardly a true lung abscess. Neither was it in the pleural cavity but located between the lobes of the lung, an interlobular abscess. Such collections may be found

between the lower lobe and the diaphragm. The condition immediately followed the extraction of teeth under a general anæsthetic. I drained this space for a week or ten days when it closed up and she went home. She did not, however, seem to get well. There remained a feeling of discomfort in the side and an irritable hacking cough. A few days after her return home she coughed up a tooth and since then, I understand, the symptoms have entirely disappeared.

PANCREATITIS, ACUTE, SUBACUTE, AND CHRONIC RELAPSING.

E. W. Archibald, M.D., and A. A. Bruère, M.D.

F. M. Fry, M.D. If this lipase is found in the liver, in the subcutaneous tissue, and elsewhere, why would not disease in these tissues lead to the presence of lipase in the urine and prevent one being absolutely certain that the disease is in the pancreas.

F. J. Shepherd, M.D. I should like to express my pleasure in hearing this paper and the interesting cases that have been reported. The fact that they have been diagnosed without operation is important. I think myself it is always well to drain the gall bladder, as there may have been a stone which has escaped, as Dr. Duval has said, into the ampulla of Vater. I remember a good many years ago we thought a hard pancreas indicated malignant disease. I operated on a case of supposed gall stones and found nothing but the head of the pancreas quite hard. I thought I felt some nodules here and compressed them with my fingers and they seemed to disappear, the gall bladder was opened and nothing found and then sutured. I thought that these nodules were stones in the duct of Vater and that in compressing these nodules I had moved them on or broken them up. The man got perfectly well from that time on. Of course I have seen many cases of chronic pancreatitis with gall stones and also without and I have found many get better after drainage. I have had no recurrences in any cases that I know of.

E. W. Archibald, M.D. In reply to Dr. Fry, it is true that lipase is found normally in other organs, such as the liver and subcutaneous fat, and that lipase might possibly come from these places rather than from the pancreas. Yet, of course, in these cases the pancreas is the organ definitely at fault; we are not dealing with any inflammation of the subcutaneous fat or of the liver, except possibly in certain cases of severe biliary infection. We must conclude, therefore, that it is the disturbance of the pancreas that is causing the exit of lipase into the urine. With regard to Dr. Duval's remarks that the chronic relapsing form may be due to a ball-valve stone in the ampulla of Vater, that, of course, is perfectly sound. I had one case in which this condition of affairs was

present, and Dr. Garrow's case was one of that sort. Yet the same type of pancreatitis does occur without any apparent evidence of stones at all; and I assume that, just as in the appendix, so also in the pancreas, as the result of fibrosis from preliminary inflammation there may develop a series of secondary inflammations, giving the relapsing type.

Dr. Shepherd advises draining the gall bladder as a routine thing. Certainly one would always be inclined to operate in these cases (if only in an exploratory way), because after all one can never be quite sure that the pancreatic lesion is not dependent upon a stone which might be removed, or adhesions round the pancreatic head, which might be separated; but if in the course of such an operation one does not find any of these conditions, the etiology remains unclear and draining would seem to me to be hardly indicated. I prefer to give Urotropine, upon the offchance of the lesion being due to infected bile. This is a less serious form of therapy than a cholecystostomy or cholecystenterostomy.

OSTEOMYELITIS: RECOVERY OF TYPHOID BACILLUS 20 YEARS AFTER PRIMARY INFECTION.

A. H. MacCordick, M.D.

J. M. Elder, M.D. I would like to say that, though I operated upon this case, mine was merely the mechanical part; the presumption that this was possibly an old typhoidal lesion was due entirely to the physician who had charge of the case and who worked it out, namely, Dr. Lafleur. The wound healed by primary intention. The history was that these attacks would come on, apparently after she walked a little more than usual, the pain being very violent. This condition, off and on, persisted for a good many years. I do not think there is another case where a pure typhoid culture has been recovered from the bone after twenty years. Keen reports a case of, I think, seven years, and I remember one case from Dr. Blackader's wards which I operated on four or five years ago, and, if I remember rightly, she had been in the hospital eleven years previously with a history of typhoid fever and more or less trouble with a typhoid node on the tibia ever after. Here we got a pure typhoid culture also.

The case under discussion gave a positive Widal reaction of the blood, and an interesting question would arise whether typhoid bacilli were present in the stools, and whether, therefore, she would be capable of conveying typhoidal infection all these years. I regret that we did not settle this point in our investigations of this very interesting case.

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THE PATHOLOGY AND TREATMENT OF DIABETES MELLITUS, VIEWED BY THE LIGHT OF PRESENT-DAY KNOWLEDGE.

BY

F. W. PAVY, M.D., F.R.S.

The last of three lectures delivered before The Royal College of Physicians of London, 24th November, 1908, published under arrangement with the author.

(Concluded.)

I will now pass on to the consideration of a subject which holds a position of great importance in connexion with diabetes. I have dealt at some length with the incorporation of carbohydrate in the building up of bioplasm, and, under a redundancy, with its dissociation in the form of glycogen, as a storage material, to be subsequently brought into use when need may arise. As glycogen is of higher construction than the sugar which enters the molecular complex, the transmutation operation must be looked upon as constituting the result of building up.

Dissociation of carbohydrate in another form—that of sugar, occurs in association with the pathological state existing in the severer kind of diabetes. To this kind of diabetes I have applied the term "composite," because the eliminated sugar is derived from a twofold source. It comes in part from defective assimilation of the food carbohydrate, and in part from the carbohydrate which has been previously put into combination, and is, from a wrong katabolic action, dissociated.

There must be a flaw of some kind or other in the bioplasmic mechanism to lead to this dissociation of sugar. When the normal katabolic procedure passes on to its proper destination, metabolism proceeds to the attainment of an exhaustion of the latent energy contained in the food-stuff products that are being utilised, and the end-products consist of carbon dioxide, water, and ammonia. In the place of progress to this natural destination, it is found, in the condition being referred to, that the chain of continuity in the bioplasmic mechanism is broken in a

manner to lead to the dissociation of sugar. An influence is brought into play which leads to the sugar being broken off from the bioplasmic complex, and, perforce, carrying with it unutilised energy.

This molecular disruption attended with the dissociation of sugar stands, in reality, in the position of a reversed natural action, occurring in place of the line of change that ought to be passed through. The built-up molecule, under the influence of the environment existing, fails to continue functioning in a proper manner, and, instead, undergoes the dissociation observed. As we have already seen, a similar disruption occurs whilst blood impregnated with phloridzin is circulating through the kidney. Away from the kidney, phloridzin exerts no action, but in association with a condition supplied by the kidney structure, it brings about, after the manner of enzymic agency, the severance noticed.

I must here state that, because a certain amount of sugar is being eliminated upon what may be regarded as a properly restricted diet for diabetes, it must not necessarily be taken that the sugar is derived from the wrong breaking-down process being referred to. Meat contains a limited quantity of free carbohydrate. It also contains locked-up carbohydrate in its protein ingredient. From these sources, sugar may pass into the urine in a purely alimentary case of diabetes. If it does, the defect in carbohydrate assimilative power must be of an extreme character and closely border on the next step in which, in addition to the absence of assimilative power, there is a commencing breaking-down of protein in which carbohydrate has been previously locked up.

Facts can be adduced in substantiation of the proposition just set forth. I have now and then observed in cases of diabetes without the coexistence of associated elimination of the acetone series that, after a large quantity of meat taken at a meal, there has been a show of sugar in the urine, whilst after a moderate quantity, there has been none. Two large helpings of meat, in other words, might give rise to an appearance of sugar when one might fail to do so. This agrees with results that I notice recorded showing the effect of the ingestion of meat on the elimination of sugar in experimental pancreatic diabetes. If reference be made to Hill's "Recent Advances in Physiology and Bio-chemistry," 1906, page 348, it will be found that an experiment on a dog is mentioned in which, in the absence of food, the sugar fell to 0.77 grms. in the 24 hours, and that, after then giving meat, it rose in the first 24 hours to 3.61, and in the next to 6.09.

Allied to the sugar elimination that has its source in a wrong breaking-down of the bioplasmic molecule may, I consider, be classed the elimination of the acetone series of bodies. This constitutes one of the

most important matters connected with diabetes, inasmuch as it is through its instrumentality that the fatal termination of the disease is ordinarily brought about. Sugar, in proportion as it is present in the blood, produces toxic effects of various kinds, which may lead indirectly to death, but it does not, in a direct manner, kill. With regard to the acids belonging to the acetone series, however, the same cannot be said. Their effect in the blood is to interfere with the performance of one of the necessary functions of life.

The continuance of life is dependent upon the elimination of the carbon dioxide produced as a result of vital activity. The sodic carbonate, and, to a certain extent, the sodic phosphate, are the cardinal agents for conveying the carbon dioxide from the tissues to the lungs. If, through any abnormality, there should be an entry of acid into the blood, establishing what is known as a state of acidosis, the alkaline base will be appropriated by it, and thence be prevented contributing to the transport function, as normally designed it should do.

With such circumstances present, and with the acidosis condition growing in intensity, as it will proceed to do, unless it should happen, as where the diabetic state has not attained too advanced a stage, to prove susceptible of being checked, death must sooner or later prove an inevitable result. For vital activity, as for enzyme activity, it is necessary that the products of change should become removed. Their accumulation leads to a stoppage of action, and the issue in connexion with diabetes resolves itself into a question of when the non-removal has attained a sufficient height to reduce the occurrence of action to a point that is no longer consistent with the continuance of life. If, preparatory to this stage being actually reached, a fresh power be given to the blood to take up carbon dioxide, as by the intravenous injection of a sodic carbonate solution or the ingestion of it by the mouth, a speedy restoration of activity temporarily, but unfortunately only more or less temporarily ensues.

The view here detailed was brought forward by me in an article, published in the second volume of the *Lancet* for 1902, entitled "On the Acetone Series of Products in connexion with Diabetic Coma." In this article I state that "writers speak of the altered constitution of the blood by the reduction of its alkalinity as the cause of the coma connected with acidosis and refer the result to the effect of the altered condition of the blood on the tissues of the body. This, however, amounts only to an assertion which gives no insight into the actual pathogeny of the coma." I then open out the view I have mentioned, and in what has preceded, reference is distinctly made to its having been discovered

that, in connexion with the acidosis, a great fall in the carbon dioxide content of the blood has been observed. Not long after the article was published, exception was taken by Drs. Beddard, Pembrey, and Spriggs to the view I had announced, and they have based their conclusions upon the meaning they give to the fall of carbon dioxide in the blood noticed in their experiments. I will avail myself of this opportunity to give an answer to what they have said.

They have furnished an elaborate series of experiments which, judging from appearances, may be credited with having been carried out in a commendably careful and painstaking manner. These experiments, however, throw no additional light upon the subject. They simply give confirmation and precision to what had been ascertained before, rendering it quite evident that the acidosis in diabetes is attended with an advancing fall in the carbon dioxide content of the venous blood, and, secondarily to this, with a fall of it in the pulmonary alveolar air. A major point, in the eyes of the experimentalists, belonging to the matter, is the effect produced upon the blood by the hyperpnœa that shows itself in diabetic coma. I agree with them to the extent that hyperpnœa has something to answer for in connexion with the reduced carbon dioxide content of the blood associated with the coma. It is only naturally to be expected that the exalted respiration should contribute to the reduction that occurs and the hyperpnœa may be looked upon as constituting an effort of Nature to rectify the defect existing in connexion with tissue respiration, by producing, through reduced carbon dioxide tension in the blood, as favorable a condition as possible for promoting the drawing off of carbon dioxide from the tissues.

The conditions belonging to the blood, however, represent only one side of the question. On the other side, there is the tissue production of carbon dioxide as an act concurrent with life, and the necessity of its removal when formed, in order to sustain the continuance of life. The supply of oxygen and the removal of carbon dioxide are necessary factors in connexion with vital activity. Arrest either operation, and vital activity ceases. To give greater security to life, the mechanism of respiration is brought into concerted action with the demand existing for its functional activity. Does anyone say that exalted respiratory action is not induced by a deficient supply of oxygen on the one hand, or a defective removal of carbon on the other? By a stimulus generated within the body by the existence of either of these conditions, a response is called forth from the respiratory nerve centre, which leads automatically to the result that follows. The recent work of Haldane and Priestly

stands in accord with this view, and it is supported by the still later work of Hill and Flack.

According to my opponents, however, things are to stand on a different basis, and a new factor is gratuitously invoked, holding a place altogether outside the realm of respiratory action. Through the prolonged acidosis, they suggest that the protoplasm of the cells is made more sensitive to the stimulating influence of any acid body produced during metabolism, and thus, by the direct action of acid, the diabetic coma becomes evoked. To quote their own words, they say:—"It is suggested that the following process is taking place in the nerve-cells of the medulla: the decreased 'reactivity' of the protoplasm of the cells due to the prolonged acidosis renders their reaction more easily disturbed by, and therefore makes them more sensitive to, the stimulating influence of any acid body, including carbon dioxide and other acids produced during metabolism." (Journal of Physiology, 1908, XXXVII. xli.).

Now, no need exists for going outside respiratory action and bringing in a vague, unsubstantiated, extraneous explanation of the kind here offered. The effect of acidosis is to lessen the carbon dioxide transport service performed by the sodic carbonate and sodic phosphate of the blood, in proportion to the extent to which the base of these salts becomes appropriated by the acids present. Carbon dioxide is constantly being produced as a result of living action, and I think no one will contend that it does not require to be removed *pari passu* with its production. Observation shows that in enzymic and living action the effect of retention of the products generated is to inhibit, in proportion to their retention, the continuation of action, and thus, in the case under consideration, to slow down the production of carbon dioxide. This is the essential point connected with the matter, and to it the experimentalists referred to have given no attention, thereby, I consider, placing themselves upon false ground by taking too narrow a view of the matter. Their work has been limited to a study bearing on the blood, which only plays a secondary part by effecting the removal of the carbon dioxide produced, and obviously, if the alkaline bases of it are placed in a position to be unable to contribute to the removal of the carbon dioxide, the production of it must be interfered with, and the amount entering the blood lowered, as is found to be the case in advancing acidosis. I do not consider that what is said about the blood in diabetic coma still possessing, in the circumstances named, some absorbing power over carbon dioxide, can be taken to invalidate the considerations belonging to the other side. It is not permissible to conceive that all power of taking on carbon dioxide can be lost. Such a condition is not consistent with the

existence of any evidence of life. The question hinges on degree of power, and what is of concern in the matter is the capacity of the blood for drawing off the carbon dioxide from the tissues whilst it is normally traversing the capillaries. There is nothing to show the degree of carbon dioxide tension in the tissues that is detrimental to bioplasmic activity, but I should think it may be taken that the gas, as it is produced, requires at once to be removed.

The agents producing the acidosis are the B-oxybutyric and diacetic acids. The former is the acid started with, and from it the latter is evolved by oxidation, and this, by escape of carbon dioxide, passes into acetone. The bodies are thus linked together into a series, and in speaking of their source, the question resolves itself into that of B-oxybutyric acid.

From chemistry we learn that butyric acid stands as a lower member of the class of fatty acids to the higher members of which belong stearic, palmitic, and oleic acids, components of the fats largely occurring in the human body. In the process of oxidation, it is usually the B-carbon atom of the fatty acids which primarily, both inside and outside the living organism, becomes oxidised. By oxidations in the B position, followed by hydrolytic cleavage, descent can be made from a higher to a lower member of the fatty acid series. A succession of these downward steps leads to the formation of butyric acid, which subsequently passes, by oxidation, into B-oxybutyric acid. In this way, the derivation of B-oxybutyric acid from the normally occurring higher fatty acids can intelligibly be accounted for.

Now, such being the chemical position in which oxybutyric acid stands, ought we not to look to fat for its clinical source? Fat has been already spoken of as a constituent of the bioplasmic complex, thereby standing in the same position as carbohydrate. By wrong katabolism, we have seen that sugar is thrown off, and it is only an analogous procedure for the throwing off of oxybutyric acid likewise to occur. Under the existence of a redundancy, fat and glycogen are thrown off as a normal occurrence for storage purposes, and they are both of them principles suitable for storage on account of the non-diffusible property they possess. In the case, on the other hand, of abnormal dissociation, in each instance alike the product thrown off is of a diffusible nature and thereby incapable of retention in the system. Hence the elimination of both the sugar and the oxybutyric acid with the urine.

Sugar, under the circumstances, is the result of a faulty molecular breaking-down, and must not the same be said of oxybutyric acid? The two seem to stand in a parallel position, carbohydrate in the one case,

and fat in the other, being implicated, but not necessarily acted upon by the same specific cause. As to what stands at the foundation of the intra-molecular error that is attended with dissociation of oxybutyric acid is beyond us at present to discuss. The fact of the dissociation is a point of the deepest clinical interest, and I will proceed to give consideration to it, setting forth the information that we can claim to be possessed of, that will help us in dealing with the matter as medical practitioners.

It would seem, from the fact that acetone is not absolutely a foreign body in connexion with the normal state, that there must be some subsidiary action normally occurring in the direction of its production. Under certain conditions, the acetone bodies come into more prominent view. Amongst these may be mentioned, starvation and other conditions of a nature to lead to inanition, the exclusion of carbohydrate from the food as by restriction to a flesh and fat diet, and some febrile diseases, especially when occurring in children. In these cases, the bodies in question do not show themselves to a sufficient extent to produce any damaging effect; there is, however, another class of case with associated acidosis to which attention has been recently directed—delayed chloroform poisoning and cyclical or recurrent vomiting in children—where fatal effects as in diabetic coma have been observed to occur.

It is ordinarily in connexion with diabetes that the elimination of the acetone group assumes significance. With no other disease is it in a like manner associated. It had been for a very long time known that the urine and breath of diabetics might possess a peculiar odour, since found to be attributed to acetone, but until the recognition of diacetic acid in the urine by Gerhardt of Berlin in 1865, no idea existed of the intrinsic nature of this associated condition from which such serious consequences may arise in connexion with diabetes. Although the cleavage process that leads to the appearance of the bodies is virtually independent of that which leads to the dissociation of sugar, yet experience shows that some kind of relationship exists between the two. They seem, in other words, to march on in a parallel manner together.

If a case is dealt with in a way to permit of the elimination of a large quantity of sugar, which implies that the system is being subjected to the toxic influence of the sugar traversing it preparatory to elimination, sooner or later the acetone series may be expected to come into view. It is true it may happen, only very rarely have I seen it do so, that through want of proper attention being given to food, a more or less marked amount of sugar may be voided for several years without the acidosis condition becoming developed. At the same time, however, the

patient, in the circumstances specified, is not exempt from the supervention of the other ill effects arising from the toxic action of the sugar in the system, and has to pay the penalty for the injudicious course taken, by becoming the subject of neuritis, gangrene of the toe, carbuncle, cataract or some other concomitant trouble.

There can, I consider, be no doubt that individuality has much to answer for in connexion with the supervention of the acidosis condition. With a sensitive, high strung nervous organisation, experience leads me to look for a proneness to the appearance of acidosis. In persons of a worrying, restless, dissatisfied nature, its greater liability to show itself gives an increased gravity to this class of case. Perhaps the greater liability to show itself depends upon the nature alluded to constituting an unfavourable factor in connexion with the progress of the disease itself. In children, it is ordinary for it to set in close to the onset of the disease, and for it soon to assume a more or less pronounced character. Moreover, in children it does not usually disappear during the time the sugar is susceptible of removal by dieting, as it may do in the adult.

I have already stated that, apart from diabetes, the acidosis condition is susceptible of being evoked by, amongst other causes, absence of food. Deprivation of carbohydrate alone suffices to act in a similar way. Now, food is found to constitute an influencing factor on the elimination of the acetone bodies in the diabetic, and it here stands in a position to be invested with bearings of the deepest importance. According to the reading adopted of the results producible by food on the acetone bodies in diabetes, the medical practitioner may be conducted along a right or a wrong path in the treatment of the disease. In the interests of medical art, and, through it, of the patient, the subject therefore demands consideration of the broadest, the most substantially grounded, and the most judiciously weighed nature, that can be brought to bear upon it.

Experience shows that the acidosis which occurs in connexion with diabetes is influenced in the manner I will proceed to speak of by the effect of the restriction from carbohydrate food which is put into force in bringing down the sugar in the treatment of the disease. I have been in the habit, for several years past, of having the urine examined for the acetone series in all cases as a part of the examination conducted. The routine plan has been to look for diabetic acid, and this, in a multitude of instances, has been supplemented by looking also for acetone, and, in many instances, likewise for oxybutyric acid. In this way, some thousands of reports upon the point have passed under my notice, and when a positive result has been obtained, a measure of quantity has been inserted by + signs ranging from one up to five or six. It is upon this evidence that what I am about to state is founded.

As a preliminary, it must be mentioned that what is comprised under the term "restricted" diet has a very varied meaning. In reality it should mean the exclusion of carbohydrate as far as can be practically done, and this implies that the substitute for bread-stuff employed should be virtually, and not merely nominally, free from starch. There are foods of this kind to be obtained from establishments in London, whose praiseworthy and successful efforts have been brought to bear to produce it. Unfortunately another side presents itself that nowhere escapes being encountered, and here the foods contain a varying amount of starch, which may even, in some cases, be found to reach that belonging to the bread-stuff food in common use. A moment's reflexion will suffice to show that no proper knowledge can be obtained with reference to the matter under consideration in the absence of a knowledge of the actual state of the food consumed by the patient.

Generally, at an early stage of the disease (children excepted), the effect of putting the patient on a restricted diet is not attended with the production of an appearance of the acetone bodies. At a later stage, in a case where dieting has not been in a proper manner carried out, and where sugar has been all along voided, the effect of cutting off carbohydrate food may be expected to lead to a certain amount of show of the acetone bodies. Afterwards, when, as a result of the dieting, the sugar is reduced and subsequently removed, the acetone bodies may, in the course of a little time, be counted upon to make their disappearance.

In a case of a somewhat advanced nature, where the acetone bodies have already become present, the change of diet leads to a certain amount of augmentation of them, but the augmentation that shows itself does not afterwards intrinsically tend to proceed further. In fact, the issue is dependent upon the stage of disease that has been reached. If too advanced to admit of rectification, the disease and its associated acidosis make headway together till it happens that the acidosis becomes greater then the power of the system to withstand, and death ensues. If not sufficiently advanced to inevitably lead to this issue, and the case should be of a suitable type to subsequently yield, the sugar, as time goes on, may be found to become more and more reduced and ultimately to disappear, and, with this, the acetone bodies may be expected to follow a similar, but more tardy, course. In this way, from what may have seemed at the beginning a very unpromising state, progress may be made through the instrumentality of the influence exerted by the food in bringing down the sugar, for this is at the root of the change induced, to the attainment of a condition in which a totally new aspect is given to the life tenure prospects.

There have been those who have deprecated the strict diet in the treatment of diabetes on account of the relation that has been referred to between acetonuria and the exclusion of carbohydrate from the food. The effect of the acids of the acetone group in leading up to coma should, it has been suggested, demand first consideration and prohibit the cutting off of carbohydrate food. If such a maxim were acted upon, diabetics would stand, as indeed they did in former times, before dieting was applied as it is now, in a very bad position. It is within my own recollection to have known that the outlook in diabetes was vastly different from what it is now. Experience shows that the way to get rid of the acetone bodies is to bring the sugar down, and if this is not done, all that can be looked for is that they will go on increasing. The sugar in the system, by its direct toxic influence, may be regarded as a main factor in causing the acidosis in the first place to set in, and then to grow. In a case where sugar and the acetone bodies have existed, and, by cutting off carbohydrate, have become removed, as long as sugar-free urine is maintained, there is no return of the acetone bodies. Let sugar reappear by relaxation of diet, and a return of the acetone bodies may be expected to likewise occur. I could cite many cases where such has happened, and have further observed a renewed disappearance on a return to the proper food.

The effect of what I have stated is to suggest that, in ordinary cases, the cutting off of carbohydrate should at once be put into force for the purpose of dealing with the acetone bodies. At the same time, however, I do not mean to say that cases may not now and then present themselves in which it would be unwise to adopt such a course. In extreme cases, where the patient is on the brink of the supervention of coma, a little increase in the acidosis existing may suffice to turn the scale and bring about a fatal issue. The sudden withdrawal of carbohydrate has been seen to lead to such increase, and thereby a demand is created for the exercise of judgment in connexion with the course to be adopted.

The frailness of the condition as a whole, in the circumstances under consideration, has also to be taken into account. We know how easily through the general state the acetone bodies may be increased. A severe attack of migraine, for instance, may send them up, and influenza, pneumonia, etc., may do so sufficiently to suddenly bring about the supervention of coma. There is too much instability of system to withstand the influence of sudden change, and thus an added condition presents itself to that emanating from the direct action of the cutting off of carbohydrate on the dissociation process, which tends to promote the augmentation of the acetone bodies passing to the blood.

I have entered at some length into the question of acidosis and its bearings on food treatment in Diabetes in my work on "Carbohydrate Metabolism and Diabetes," and at pages 117-122 will be found what I have said upon the subject.

Mal-application of carbohydrate food within the system constitutes the essential error existing in diabetes, and what is wanted to be effected by treatment is to bring conditions back into line for it to be again turned to proper account. In a state of health, carbohydrate is taken and can be followed to the seat of absorption belonging to the alimentary canal. Here, however, it becomes lost to view. Neither the blood nor the urine affords evidence of the absorption that manifestly occurs. Physiologists say, notwithstanding they are confronted with this fact, that passage of the absorbed sugar into the blood occurs, but that its removal by the tissues prevents its coming into view. This constitutes an assumption which is not only unsupported, but is opposed by experimental evidence. In former times, when it was held that a tangible disappearance of sugar took place in the passage of the blood from the arteries to the veins, some show of foundation presented itself for the entrance of sugar into the circulation, but now that it is admitted that no such disappearance is to be recognised, the entrance could only lead to presence in the blood and outflow with the urine, which represents the state of things existing in diabetes. For sugar to reach the circulation without showing itself in the urine, it would be necessary for a capacity to exist for effecting its instantaneous removal, and that no such capacity is present is made evident by the experimental injection of minimum quantities intravenously.

To keep sugar out of the urine, it must be kept out of the circulation, and any hypothesis explanatory of the procedure connected with the physiological application of carbohydrate must be based upon this principle. To regard it as falling within the natural course of events that the food carbohydrate should pass through the circulation to the tissues in the form of sugar is tantamount to taking the pathological as representative of the physiological state, seeing that it is just such passage which is productive of diabetes.

To escape from diabetes, the food carbohydrate must not be allowed to reach the general circulation in the form of sugar. This is the basis to proceed upon, and the view that has been enunciated in these lectures fits in with it. It is contended that the absorbed sugar becomes dealt with at the seat of absorption, and, in company with the products derived from protein digestion, is, by the bioplasmic action attending lymphocyte

growth, put into an elaborated state. The process falls under the denomination of assimilation, and when the sugar is thus disposed of and incorporated as a constituent of the large newly-constructed molecule, it is placed in a position to be secure from running off with the urine during the transit of the blood through the kidney.

Looked at in this way, the error in diabetes consists of a faulty assimilation of the sugar absorbed from the alimentary canal. Digestion prepares for absorption, and assimilation, which follows immediately upon it, puts the absorbed digestion products into an elaborated state, in which form they pass through the thoracic duct into the blood and there constitute the pabulum from which the tissues draw their nutrient supply. This agrees with what used to be the idea entertained by physiologists with regard to the course taken by the food principles—namely, that they became elaborated into chyle which served as a feeder to the blood. It is only in more recent years, as I have previously notified, that the shunting on to a wrong track has occurred, and that, notwithstanding chyle so obviously consists of elaborated food, the food principles have been looked upon as reaching the circulation in an uncombined, small-molecular state, for transmission in such state to the tissues.

The view I am advocating not only fits in consistently from beginning to end with what I take to be properly read physiological considerations, but supplies a working basis for the treatment of diabetes which places us upon perfectly intelligible ground. It provides for the occurrence of assimilative action preparatory to the circulation being reached, and thereby for conveyance in an assimilated state to the seat of utilisation. Thus circumstanced, the digested food products are not in a condition to run off with the urine in traversing the kidney, but stand in the blood as a retainable reserve, ready to be drawn upon by the tissues as need may arise.

To mal-assimilation of carbohydrate food is to be assigned the error existing in diabetes, and what is wanted to be effected by treatment is restoration of the defective assimilative power. Restore this power, and the patient will be no longer diabetic. Assimilative power being restored, he will then be able to take carbohydrate, and this, meeting with the power to assimilate it, will no longer pass through the system as sugar to be thrown out as waste material with the urine.

Restoration of carbohydrate assimilative power, then, is the goal of the medical practitioner in the treatment of diabetes. For the attainment of his object, it may without hesitation be said that food is the prime factor to be brought into play. Sugar in the system is the baneful

agent, and unless this is brought down, no real good can be expected to arrive. The toxicity of the sugar will nullify every other effort. If the sugar can be reduced and removed, the foundation is laid for the desired restoration of assimilative power, whilst in the absence of its reduction, the condition, with varying degrees of rapidity in different cases, may be reckoned upon to grow worse and worse.

This being found from practical experience to be the case, any hypothesis which encourages the idea that it is a natural condition for free sugar to be reaching the circulatory system from carbohydrate food acts detrimentally to the interests of the art of medicine by suggesting the absence of the need for putting into force the one measure that the circumstances show to be essential for beneficial treatment. Upon these premises, the medical practitioner has ground for exclaiming against the misguiding influence derived from his physiological training. But physiologists see nothing of the testing of the truth of their teaching that is afforded by the application of endeavours to correct the physiological error constituting the source of diabetes, and they thereby are shut off from the enlightenment contributed by practical medical experience.

It will be seen that under this view the error is located in the first link of the metabolic chain instead of the last, which is assigned as its seat under the glycogenic doctrine. There is absolutely nothing to lend support to the view that the fault in diabetes (the simple or alimentary form of it) consists of a non-consumption of carbohydrate, except in so far as consumption is prevented by exit in the form of sugar with the urine in consequence of being permitted to enter the circulation as free sugar.

With faulty assimilation, as represented, at the foundation of diabetes, it is perfectly intelligible how it is that sugar finds its way into the urine from the food. From the principle of action involved, it is also explicable how the blood and urine under normal conditions remain unaffected, in relation to sugar content, in the face of the very varying quantities of carbohydrate ingested. Under all circumstances, alike in health and diabetes, as long as the carbohydrate taken is within the assimilative power existing, it becomes assimilated, and hence fails to reach the blood and urine as sugar, whilst should it surpass in amount the power existing to assimilate it, that which is not assimilated will find its way as sugar into both blood and urine.

This harmonises with what is observed in cases of diabetes in which the curtailment of carbohydrate tolerating power is susceptible of being displayed—that is, in the alimentary type of the disease. Experience

tells us that varied extents of tolerating capacity are found to exist and that they are associated with a very sharp boundary line. The ingestion of carbohydrate within a given quantity fails to produce any visible effect, whilst if the given quantity is exceeded by ever so little, sugar is discoverable in the urine in proportion to the extent to which the line has been overstepped. It is easy to understand that there may be a definitely limited assimilative power—indeed, there is a definite limit to the assimilative power existing in the healthy state—and that whilst the power that exists surpasses that required for the work to be performed, there will be no show of anything wrong, whereas if the work to be performed —the amount of carbohydrate to be assimilated—should exceed the power to perform it, the effect will be that the work which escapes being performed will render itself manifest by the unassimilated carbohydrate passing into the circulation as sugar, and thence flowing off with the urine.

Regarded in this way our position in relation to the management of diabetes becomes one of great clearness and simplicity. We know precisely the ground upon which we stand, and can shape our measures into form with great definiteness to bring about a desired result. How, on the other hand, does the matter stand under the supposition that it is natural for the food carbohydrate to traverse the circulation in the form of sugar? Not the slightest relationship is discoverable between the proposition and the working result obtained. Whatever may be effected by the measure adopted, no rational explanation applicable to it can be educed from the proposition.

Restoration of carbohydrate assimilative power is, as I have said, the great object to be attained in the treatment of diabetes, and, as I have further said, for the attainment of the object, it is necessary to reduce and remove, by dietetic measures, the sugar which is acting perniciously in traversing the system. The primary effect of the removal of sugar from the urine is to bring back health and strength to the patient. Virtually, as long as the urine is maintained in a sugar-free state, there is nothing to exert a damaging influence upon the system, and the only perceptible difference existing between a patient in this state and a healthy person is the different effect arising from partaking of carbohydrate food. Only when such food is taken beyond the power existing to assimilate it does the patient betray the existence of anything wrong.

Restoration of health is something for the patient to be thankful for, but this is by no means all that the removal of sugar from the urine by proper dieting effects. By maintaining a sugar-free state of urine—in

other words, by maintaining a normal state of things within the system, Nature steps in and starts mending what is wrong by re-instating the lost assimilative power. In this way there occurs a reversal of what happens whilst sugar is pervading the system, for here there is an advancing loss taking place, as is testified by the progressive growth of a case previous to the disease being recognised and dietetic treatment adopted. At first the condition may be mild, so much so as not to excite attention, when it may be taken that a considerable amount of assimilative power exists, and then, with the growth of the symptoms, a fall of power must obviously be taking place.

When a case falls under observation, everything depends, with respect to capacity for and speediness of restoration of assimilative power, upon the extent to which the disease has become developed. If only of recent onset, a few days may suffice for the removal of the sugar and, shortly after, for signs to present themselves of returning power; whilst if the disease has, through faulty management, been allowed to run on into the development of a thoroughly established condition associated with marked acidosis, the prospect is a poor one of being able to bring about the requisite control of sugar elimination to permit of anything otherwise than continued progress in a wrong direction being looked for. The presence of acidosis is not by any means, it may be said, to be regarded as a bar to subsequent satisfactory progress. It is the point to which it has advanced that determines the issue. I have known cases where more or less return of assimilative power has occurred notwithstanding a considerable amount of acidosis has existed to start upon.

When the setting in of restoration of carbohydrate assimilative power will occur, cannot in any case be predicted. It may be within a few weeks, or a few months, or it may be delayed for a few years. A striking instance of long delay is afforded by the following case of a patient who was 42 years of age when he came to me on October 14, 1904. He was then in a very broken-down state and his urine contained 71.4 per 1,000 of sugar associated with a certain amount of diacetic acid and acetone. Notwithstanding close attention to a properly restricted diet, the declining sugar did not disappear till the end of about six weeks. On November 18, there was a litttle sugar present, but on December 3rd there was none. The patient became restored to health and continued on the strict diet till July 28, 1906, before any sign was afforded of returning assimilative power. Acting upon the indication then presented, 3 ozs. of ordinary wheaten bread per diem were tried and found to be tolerated. At the end of September there were indications of further restoration of

assimilative power, and the bread was increased to 4½ ozs. per diem without any return of sugar. No further indication of growth of power has since appeared, and the patient, who was last seen on November 14, 1908, is so far maintaining a perfect state of health with food adjusted to the curtailed carbohydrate assimilative power that he possesses.

When restoration of assimilative power sets in, there are unmistakable signs to denote its occurrence. These consist of a fall in weight and a bodily feeling of sinking or food want. As long as there is no return of assimilative power, the restricted diet suffices to meet the requirements of the system, and a proper state of equilibrium exists within. Not so, however, when restoration of carbohydrate assimilative power has taken place. Here the restricted diet, as in the healthy person, fails to meet the demands of life, and Nature reveals it through the signs that have been referred to. Whilst no carbohydrate assimilative power exists, a supply of carbohydrate cannot be needed by the system. When, however, the power becomes restored, carbohydrate becomes immediately, to a proportionate extent, wanted,—a fact that is plainly shown by Nature's revelations. These revelations, associated with sugar-free urine, may be safely read as meaning the setting in of returning assimilative power, and that action should be taken accordingly. The action needed is the supply at first of a limited amount of starchy food. The urine immediately tells the tale if too much is given. Afterwards, the starchy food must be increased as the restoration of power advances, always keeping the amount given within the boundary line of the power existing.

The extent to which the assimilative power becomes restored varies greatly in different cases, but in each a sharply defined line throughout the progress exists. In a certain number of instances it becomes restored completely, which implies that the attack of diabetes has been in a direct manner thrown off. It is usual for it to become restored up to a certain point and there to remain more or less fixed. If a patient, in the presence of these circumstances, should take carbohydrate food beyond the power existing to assimilate it, and thus give rise to a renewal of the transit of sugar through the system, the assimilative power will again decrease, and should a marked amount be allowed to pass through, the condition may be expected in the course of time to become as bad as it was at the beginning, if not even worse. It is in this way that relapses take place, and for the maintenance of a satisfactory state, the maintenance of sugar-free urine constitutes a *sine quâ non*. The sugar that pervades the system as an effect of the disease thus becomes a paramount factor in relation to issue.

The class of case upon which the remarks I have made have been based is that belonging to the "alimentary type" of the disease, which is the common form met with in patients above the middle period of life. Ordinarily in young subjects the case at the beginning runs upon the lines that have been depicted, but later, on account of the existence of an inherent progressiveness, the treatment which at one time succeeded in keeping things right fails any longer to do so, and a relentless onward march ensues. Progress into the "composite" or bad type is not always to be averted in later years, but it is very much accelerated by improper dietetic management, and when the advanced stage is reached, the case, on account of sugar being derived from tissue disintegration as well as from food, is naturally no longer susceptible of being influenced by diet in the same manner as whilst belonging to the "alimentary" type. Unfortunately for the training of the student, the class of case that is usually met with in the hospital belongs to the "composite," and not to the "alimentary" type.

It is something to achieve to be able to effect a restoration of assimilative power that will permit of a certain quantity of starchy food being taken. The patient is placed in a much less difficult and much more comfortable position. I first hinted at the recovery of the power in the Supplementary Croonian Lecture delivered by me at the Royal College of Physicians of London in November, 1897 (*British Medical Journal,* 1897, vol. ii), and subsequently, in a communication published in the first volume of the *Lancet* for 1900 under the title of "Differentiation in Diabetes," I entered into a detailed consideration of the matter. The subject has also been fully dealt with in the section on Diabetes contained in my work on "Carbohydrate Metabolism and Diabetes," 1906, and notwithstanding the light that the information throws upon the whole question concerned, and the satisfactory basis that it supplies in connexion with the application of treatment, I have not seen that the attention it deserves has been given to it.

It follows from what has preceded that the physician is dependent for success in treatment upon the character of the food that is available for his patient. Through the incentive that has been created for meeting the demand that has arisen for a pure and palatable diabetic breadstuff food, endeavours have been successfully applied in the direction needed, and there are now establishments in London from which the diabetic can reliably obtain his required supply. At the same time, there are foods produced and sold under the name of diabetic foods that are not entitled to receive this designation, and they constitute the source of

a great amount of harm. Many are no better than ordinary domestic foods, and others contain too much carbohydrate to permit of its being possible, in the usual run of case, to get rid of the sugar from the system.

In illustration, I may refer to some foods that fell under my notice about a year ago in the following way. In connexion with the case of a boy patient, a physician from Paris on a visit to London was, at the request of an uncle, permitted to see the patient, and on his return home, he despatched a parcel of diabetic foods obtained from a well-known supply establishment in Paris. Here are the figures showing the percentage of carbohydrate expressed as starch that they contained in the water-free state, into which, for apt comparison, all foods should be brought previous to analysis.

	Carbohydrate as starch.
Gluten flour	72.0 per cent.
" bread	50.0 " "
" biscuit	54.7 " "
Granulated gluten	63.9 " "

Food supplied by Rodemann, of Frankfurt, was referred to when I was speaking of Professor von Noorden's "oat" cure. Samples were obtained from this maker at the early part of the present year, and the figures here given show the percentage of starch present in the articles in the water-free state. An improvement is perceptible upon the figures previously yielded.

	Carbohydrate as starch.
Diabetic White Bread	47.2 per cent.
Diabetic Graham Bread	40.8 " "
Diabetic Black Bread	41.09 " "
"D. K." Bread	74.5 " "
Diabetic Rusks	46.5 " "
Diabetic Cakes	44.4 " "
Diabetic Meal	62.0 " "

I have said nothing about drug treatment, and for the reason that I know of nothing that by itself exerts a direct and immediate arresting influence over the elimination of sugar. In reality, something is wanted to set metabolism right, in like manner as it is set right by the thyroid extract in myxœdema. This something has not yet been discovered, but science ought sooner or later to place us in a better position than we at

present stand in relation to the matter. We, however, know that metabolism is influenced through the instrumentality of the nervous system, and this is suggestive that it may, in connexion with the point under consideration be likewise open to being influenced in a collateral way by drug agency. I am a strong believer in benefit being conferred by the administration of opium and some of its derivatives.

NOTES ON ANTERIOR METATARSALGIA.

BY

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The subjects about which I desire to speak to-night are Morton's Disease and Anterior Metatarsalgia. Although the principal symptoms of the chronically strained or weak foot have been more frequently, in the past, described as due to a pathological condition of the posterior or longitudinal arch, it is really not rare to find very similar symptoms depending upon an abnormal anterior, or transverse, arch.

As long ago as 1876 Dr. T. G. Morton, of Philadelphia, described that series of symptoms, which have since borne his name. His description preceded by many years our present knowledge of their predisposing and exciting causes. Typical cases as described by him were characterized by sudden cramp-like pain *in the region of the fourth metatarso-phalangeal articulation.* This pain may begin as a burning sensation beneath the toe, as a numbness or tingling feeling, as a sudden cramp, or as a peculiar feeling of discomfort that increases in severity until it almost becomes unbearable. This pain may first be localized in the neighbourhood of the joint affected, but frequently radiates widely.

You are all familiar with Morton's explanation of the causation of the condition which he described. The plantar nerves were said to be pinched by the adjoining fourth and fifth metatarso-phalangeal joints. Morton advocated excision of the head of the fourth metatarsal bone to relieve the possibility of such compression.

The more comprehensive term *anterior metatarsalgia* was suggested by Pollosson, of Lyons, in 1889, who quite fully described the affection, drawing attention to the fact that little or no pain is felt when the foot is at rest; that greater pain is felt in going down a hill than in climbing up; that the wearing of a boot or shoe conduces to pain which often comes on suddenly, accompanied by the sensation that something has

A synopsis of a paper read at the Montreal Medico-Chirurgical Society, March 19th, 1909.

given away. He mentions that the patient may suffer from the sensation of grating of the bones and makes the observation which has been confirmed so many times since, viz.: that pain may be relieved by supporting the sides of the foot, especially if this be accompanied by pressing upwards the heads of the middle metatarsal bones. Pollosson advanced the theory that is now accepted that the affection is due to a "certain laxity of the transverse metatarsal ligament" and recommended the application of pads to support the arch—a treatment universally accepted at the present day.

An Englishman, Roughton, wrote to the *Lancet* almost immediately after the publication of Pollosson's observations: "I think that there can be no doubt of the reality of the affection described under the name of Anterior Metatarsalgia by Doctor Auguste Pollosson of Lyons." Roughton further gave the history of several cases, drawing attention to the burning pain so often felt in the fore part of the sole of the foot being "sometimes so severe as to cause him (the patient) to remove his boot and grasp the sole of his foot in his hand," thus confirming Pollosson's observation as to its relief. He suggested the appearance of a convexity of the normally concave anterior arch and recommended for the strengthening of the same such exercises as raising the body weight on the toes. With the theory of such treatment, however, I cannot agree.

In 1892, Guthrie wrote to the *Lancet* about the same subject, calling the affection, however, after one of its symptoms "a form of painful toe." He himself was a martyr to the affection and consequently writes a vivid description of its symptoms as they affected him. He writes that suddenly while standing in a theatre he was seized by a "most severe shooting and burning pain in the fourth toe." He remarks "the boring of a hot iron into the flesh might have caused similar pain. It extended up the nerves of the outer side of the foot and leg into the sciatic with a numbing, sickening sensation"..... On taking off his boot he found that the last phalynx of the fourth toe was extended, while the head of the second was slightly displaced downwards. Mr. Guthrie, perhaps, did not fully realize that muscular spasm is a not uncommon symptom of anterior metatarsalgia. He, however, recommended that the condition should be treated by the use of proper boots and reported cures by such treatment.

Thirteen years after Morton's monograph, Goldthwait, in 1894, suggested that the term Anterior Metatarsalgia should be employed to include Morton's Disease and other similar conditions about the anterior arch.

Whitman, of New York, in 1898, concurred in this suggestion in a

most interesting article in which the following statistics are quoted:—In 78 cases of Anterior Metatarsalgia pain was referred to the fourth metatarso-phalangeal articulation in 60; to the third and fourth in 6; to the second, third and fourth in 6, and in but six was the fourth articulation free from pain.

Whitman also drew attention to the paper of Robert Jones, of Liverpool, written in 1897, which recognized the depression of the anterior arch as the cause of the symptoms and also that "the characteristic pain was not caused by pinching of the nerves, Morton's theory, because the metatarsal bones are separated when the arch is depressed; but it was the result of the direct downward pressure of the misplaced bones upon the plantar nerves in the sole of the foot, practically Woodruff's theory" or, I believe, Pollosson's and Roughton's theory.

In the last edition of his text-book Whitman points out that Anterior Metatarsalgia is far more common in private than in hospital practice. The average age of the patient in the reported cases was thirty years. It is more frequent in females than in males, and frequently the sufferers are of an extremely neurotic type. The affection is frequently extremely chronic in duration.

An interesting feature is that pain, when referred, usually extends up the dorsum of the foot towards the sciatic. Doctor Guthrie described it as extending up the nerves of the outer side of the foot and leg to the sciatic. This is of interest, demonstrating as it does, that the affection is evidently not a "plantar neuralgia" in that it is not primarily an affection of the plantar nerves.

Anatomy.—The anterior or transverse metatarsal arch is shown on the outer side of the foot as a depression on the outer side of the great toe. When weight is borne this depression is obliterated. When the arch is weakened or broken down the natural resiliency is lost. The centre of the arch may not only be normally depressed, but, perhaps, fixed in a position of depression.

Weakness of the anterior arch is like weakness of the posterior arch in that great pain may be seen with little deformity, or conversely, little pain with great deformity.

Depression of the anterior arch predisposes to pain because of pressure on a persistently depressed articulation and, as Whitman has explained, because the metatarso-phalangeal joints of an habitually depressed arch are exposed to the direct lateral compression of a narrow or ill-shaped shoe.

Pathology.—Morton and his immediate successors, as we have seen, believed that the symptoms were due to a pinching of the interosseous

nerve. This is probably partially true in such cases of anterior metatarsalgia as were described by Morton, but the primary lesion in all, however, is a weakening of the anterior arch with a depression of one or more bones. This depression causes pain in two ways: firstly, by the fact that the head of the sunken metatarsal bone acts as a foreign body lying between the neighbouring bones, which form the arch, and the integument; secondly, because the depressed bone, especially if it be the fourth, may be overridden by its neighbour or neighbours if lateral pressure is applied to the latter. This is probably the cause of the spasmodic and more or less characteristic pain described by Morton. To prove this statement examine a hand, which is analogous to a foot, place the fingers in the position of extreme flexion, a transverse or anterior metacarpal arch is clearly demonstrated. Grasp this suddenly making firm lateral pressure. Little pain is felt. Extend the fingers.—The arch disappears. A similar condition is produced to that seen in a chronically strained anterior arch of the foot. The heads of the metacarpals are closely opposed to the integument of the palm. The heads of the middle metacarpals sink to the same level as the outer metacarpals. Theoretically, now, the fifth metacarpal bone of the hand bears the same relationship to the fourth as does the fifth metatarsal to the fourth of the foot. The relationship now being similar, let us suddenly apply lateral pressure by grasping the hand, when pain, severe pain, results,—pain of a neuralgic character similar to that found in Morton's disease, and which may be similarly produced by making lateral pressure on a foot affected with this condition. This, then, is a characteristic point in the diagnosis of Morton's disease.

Causation.—The causes are general and specific.

General.—(1) General debility. (2) Excessive body weight in proportion to the strength of the foot.

Specific.—(*a*) The use of too short or too narrow a boot causing extension of the proximal phalanges with flexion of the distal phalanges. This results in a depression of the arch as is clearly demonstrated in casts of feet in this condition. (*b*) The use of a boot with too high a heel throwing the body weight on the anterior arch. (*c*) The use of a boot with too thin a sole, which insufficiently protects the anterior arch.

Symptoms.—The symptoms have been noted in the history of these affections, but may be specified thus:—

1. Pain.—Either of a constant character or spasmodic as described by Morton.

2. Tenderness.—Is found on pressure from beneath over the heads of one or more metatarsal bones, or on lateral pressure in the region of the metatarso-phalangeal joint.

3. Swelling and œdema.—May be so severe as to simulate gigantism, erythro-melalgia or acromegaly.

4. Extension of Phalanges.—Often postural and accompanied by flexion of middle and distal phalanges. This may simulate deformities following anterior poliomyelitis.

5. Muscular spasm. Usually of extensors of toes. It is reflex in nature and causes a deformity resembling No. 4.

6. Callosities on sole.—Frequent and adding to the pain of a mild case.

Diagnosis.—Anterior Metatarsalgia must be diagnosed: firstly, from the chronically strained posterior arch, and, secondly, from tuberculosis of the tarsus: from rheumatism, the so-called rheumatoid diseases, and gout; thirdly, from gigantism, erythro-melalgia or acromegaly; fourthly, from postural deformities, and fifthly, from deformities resulting from the paralyses.

Treatment.—Naturally resolves itself into: firstly, protection against lateral pressure, and secondly, the elevation or support of a depressed arch with suitable protection of the plantar surfaces of the heads of the bones. The elevation of the forepart of the foot is also of importance.

Operative treatment as suggested by Morton should be applied only in those chronic or resistant cases where conservative treatment has failed.

In certain cases characterized by great spasm of the extensors, causing extension of the toes the transference of the attachment of these tendons to the dorsal aspect of the heads of the metatarsals may be considered.

Prognosis.—In all cases good.

DIPHTHERITIC PARALYSIS.

BY

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The comparative infrequency of the graver forms of diphtheritic paralysis gives a reason for reporting the two following cases:—

Case I.—G. W., a lad of 7 years, was taken ill on December 2nd 1906, complaining of pain in the stomach and sore throat, with swelling of the neck. A physician was called on the following day who diagnosed diphtheria and sent him into the Alexandra Hospital.

On admission, his temperature was 100° F., pulse 120, small and of low tension, and respirations 28. The breath was offensively characteristic of diphtheria, there was a profuse mucopurulent discharge from the nose, the neck was greatly swollen and on examining the throat, the tonsils almost met at the middle line and were covered by a dirty gray membrane which extended on to the soft palate.

The heart, lungs, kidneys and nervous system were normal. The boy received 6,000 units of antitoxin, and, as the membrane showed no change, on the following day this dose was repeated. The throat gradually cleared up, the temperature came gradually down, and the general condition improved until December 5th, when the pulse fell rapidly from 120 to 60, where it remained for some days. The boy vomited on several occasions and on December 13th, ten days after admission, there was noticed a nasal twang to his voice and the soft palate failed to move on phonation. Regurgitation of fluids through the nose now set in and the patient's condition was one of moderate weakness and pallor, but was otherwise unchanged until January 4th, 1907, when excessive amounts of mucus were noticed to appear in the mouth and throat, which the child seemed unable to expectorate properly, and the cough with which he attempted to do so, was gurgling and toneless. Swallowing became so difficult that his nutrition was rapidly failing and on January 14, it was necessary to begin feeding by a stomach tube in spite of a marked cardiac dilatation which had appeared in the meantime. Diaphragmatic breathing now became greatly diminished, and for some days indeed the breathing was entirely costal.

The note made on January 14th is as follows:—" His condition is one of extreme weakness, with severe vomiting and a variable pulse, and the diaphragm seems to be gradually losing its action."

Feeding by the stomach tube was continued until January 29th—15 days—and on this day he began to swallow a little food naturally. Improvement gradually came on until on March 28th he was discharged 'Well.' There was at no time any ocular palsy, definite paralysis of the extremities, nor loss of knee jerks.

Case II was a boy of 5 years, referred from the Outdoor Department of the Montreal General Hospital on September 21st, 1908, with the history that for two weeks he had had a discharging sore behind his right ear, and, on September 19th began to complain of sore throat and swelling of the neck, which rapidly increased, and on the 20th he was taken to the General Hospital where a diagnosis of diphtheria was made and he was transferred to the Alexandra Hospital.

When seen on the 21st he presented a picture of extremely severe diphtheria. His neck and parotid regions were greatly swollen and œdematous; the tonsils, faucial pillars and pharynx were covered with membrane. The nostrils were discharging a large amount of purulent secretion; membrane was seen in the left nostril, and on the upper lip, and behind the right ear were grayish sloughs. The sores on the skin and the membrane in the nose and the throat all yielded diphtheria bacilli on culture.

The pulse was rapid and the temperature was 102° F. The urine was albuminous and contained casts and leucocytes. The heart and nervous system were negative.

He received 15,000 units of antitoxin on admission, and, as the condition was unaltered, the following morning 10,000 more, and again on the following two days 10,000 each, when the temperature fell and the membrane disappeared by October 3rd.

Improvement from this date was continuous until October 20th, one month after admission, when the voice became nasal and food was regurgitated through the nostrils.

Shortly afterward a double internal squint developed and weakness of both arms and legs appeared. It was noticed also that it was impossible for the patient to maintain his head in the erect position, as it would wobble from front to back or from side to side. There was no facial paralysis nor paralysis of the tongue. The pupils reacted, though sluggishly to light and accommodation, and the knee jerks were absent.

Early in November there appeared the same filling up of the pharynx with mucus, toneless cough, and inability to swallow, which were present in the first case. Later, there was complete loss of power in the diaphragm, indicated by recession of the epigastrium during inspiration, and death occurred on November 13th, the 67th day of the disease.

The autopsy performed eight hours after death revealed no microscopical changes in the pneumogastric or phrenic nerves—the heart was not dilated and but slightly fatty, but one interesting feature was a condition of evidently acute dilatation of the stomach—the organ holding over one litre and occupying a large part of the abdomen.

No examination of the central nervous system was obtained.

The comparative infrequency of the severe forms of paralysis after diphtheria is shown by Rolleston's figures of 1,500 cases of diphtheria in *The Practitioner* of January, 1909, among whom there were 335 cases or 22.3 per cent. of some form of paralysis. Of these 0.6 per cent. were of the diaphragm, 1.4 per cent. pharyngeal and 3.6 per cent. cardiac. Palatal paralysis, the most common form, occurred in 15.2 per cent.

All of the diaphragmatic paralyses set in after the fourth week.

In the matter of prognosis, Rolleston found that cases developing paralysis of the palate before the third week, showed a mortality of 35.00 per cent. from cardiac failure, as compared with a mortality of 1.4 per cent. in cases developing it at a later date.

Although in large statistics the prevalence of paralysis is as great in cases receiving antitoxin as it was before antitoxin was used, which is due to the fact that so many more recover to have paralysis; the follow-

ing figures indicate that the use of antitoxin has a very real value in the prevention of paralysis.

The percentage of cases to develop paralysis who were injected on the first day was 0, on the second 4, the third 8, the fourth 11, and the fifth 16.

In reference to the effect of antitoxin upon the development of diphtheritic paralysis, Rosenau and Anderson made some interesting observations upon guinea pigs.

They found that a certain dose of diphtheria toxin when injected would cause first paralysis and then death, another dose of less strength would cause paralysis with recovery.

Using animals thus injected it was found that antitoxin given after the onset of paralysis had no effect upon its course. Given shortly before its onset it was also without effect.

Given within 20 hours of the toxin injection it prevented paralysis. Given from 24 to 48 hours after, it had some but little effect, and a small dose, as little as one unit, given 24 hours before the toxin invariably prevented paralysis.

As Rolleston points out, one can with some degree of assurance prophesy what cases of diphtheria will likely develop paralysis, this occurring with much greater frequency and severity in those with extensive pharyngeal and nasal involvement, with much œdema of the neck, glandular swelling and nasal discharge.

And in this class may be placed the two cases just reported.

PATHOLOGICAL DISCOVERY AND ITS BEARING UPON PREVENTIVE MEDICINE.

BY

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Up to within quite recent times the term pathology has commonly been regarded as synonymous with morbid anatomy and histology, the study of the gross and microscopical changes in diseased tissues. There may be those here present who still retain this conception. It would be difficult to demonstrate on a broad scale that the great discoveries in pathological anatomy had been of direct influence upon the problems of hygiene, though much might be said regarding their indirect influence. Happily there is an increasing recognition all over the continent, and all over the world, that pathology is very much more than this, that it

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includes the study of disease in all its aspects, that it is the science of medicine, or all of that science, save the not unimportant portion which deals with treatment; that thus it is the exact study of the causes of disease, the processes of disease, the results of disease. And undoubtedly it is the last thirty-five years that have seen the great medical renaissance, and this new birth has followed upon exact observation and the employment of the experimental method. Advance in medicine has to a very remarkable degree been the outcome of exact experimental investigations conducted in the laboratory, to a remarkably slight extent has it been due to empiricism or the employment of methods of treatment upon no settled plan but on the chance that they might succeed. It matters not whether these investigations have been conducted by a chemist, like Pasteur, by a zoologist like Metchnikoff, by country practitioners, like Jenner and Koch, by army surgeons like Laveran, Ronald Ross, Walter Reed, or by those who in these later years have devoted their lives to medical research like von Behring and Roux and Flexner; all these investigations are pathological.

If thus it can be shown that the extraordinary advances made in medicine within the last generation are essentially based upon the data afforded by exact observation and pathological research, this is equally the case—indeed it is true to an even greater extent—with the special branch, preventive medicine. For if we seek to determine wherein pathological research has led to the most remarkable discoveries, and medicine has undergone the greatest revolution, there can be no hesitation in deciding that it is in connection with infectious diseases: it is the discovery of the causative agents of so many diseases, of the mode of action of pathogenic microbes in producing the symptoms of disease, and the conditions of life of these agents, that has been the great outstanding triumph of the end of the nineteenth century. Now it is precisely along the lines of controlling these infectious diseases that preventive medicine has its dominant activities—and it, therefore, even more than medicine in general, has profited from these discoveries. Regarded from this point of view it is self evident that the great pathological discoveries have had an untold influence upon public health and its problems. I fear that were I this afternoon merely to pass in reviewing these discoveries—fascinating as they are—with comments upon their bearings upon public health work, I should not tell you anything of which you were not already convinced. It would be a work of supererogation. It will be of greater service if I attempt to trace in a certain number of instances how far we were able to advance in the prevention of disease under general hygienic principles, and what has been our advance once research has afforded us a certain knowledge of causative agents.

As a preliminary let me say that we may take the period 1880 to 1887 as that in which, thanks to the work of those great founders of bacteriological science, Pasteur and Koch, the principle became surely established and accepted, that infectious disease is due to the presence and growth within the system of pathogenic micro-organisms. Some were discovered before that period, others since, yet others have still to be discovered; but by the year 1887 it may be laid down that the lay world had come to accept the new doctrine, so that from now on legislation and public health ordinances based upon it became established and began to bear fruit.

Let me begin, therefore, by discussing the general decrease in the death rate during what, as regards statistics, we may speak of as historical times, during, that is, the last three centuries.

Finklenburg, of Bonn, has estimated that the average human life in the sixteenth century was only eighteen to twenty years. In the middle of the nineteenth century it has risen to over thirty-seven years, to-day it is well over forty years. We obtain possibly a better idea of the improvement in hygiene by a study of the mortality tables of a great city like London. There from 1620 to 1643 the mortality has been estimated as *seventy* in a thousand; from 1660 to 1679, a period including the great plague, it rose to *eighty* in a thousand. After the last traces of the oriental plague left England, the improved hygiene which coping with the same had rendered imperative further reduced the mortality so that this in the period of 1728 to 1757 fell to *fifty-two* in a thousand. From this period to the end of the eighteenth century it progressively rose, owing largely, it would seem, to the continued increase in the mortality from smallpox, an increase favored instead of hindered by the first serious attempt at prevention by immunization, by the extension of the practice of inoculation of the healthy with material from those suffering from the disease. If that practice afforded a mild disease and subsequent immunity to the inoculated one, it at the same time spread the disease among his entourage. The inoculated disease was so mild that the patient was apt to take no precautions. Thus the death rate from smallpox rose until it is estimated that 3,000 persons in each million died annually from the disease. It is in 1796 that we have the first great practical discovery in preventive medicine, that, namely, of vaccination by Jenner. Here let me be just. Prior to that date it was a popular belief in several districts that cowpox shielded the individual from subsequent smallpox, and there is clear evidence that others had performed the artificial inoculation for preventive purposes. But Jenner it was who by his researches proved the correctness of this belief and demonstrated by exact experiment that inoculation with matter from cowpox protected for long periods

from smallpox. And, his observations being exact and incontrovertible, in the first years of the nineteenth century vaccination became widespread in London with, as a result, a rapid fall in the death rate to 29.2 in a thousand. Again there came a period of latency until 1835, the average from 1813 to 1835 being *twenty-nine* in a thousand. From now on the British Parliament passed a succession of acts bearing upon municipal administration, child labor, ventilation of workshops, artisans' dwellings, etc., while the water supply and drainage of the great city were greatly improved. As a result we find a period of steady fall inaugurated, with death rate of *twenty-five* in a thousand in the decade from 1841 to 50, a little over *twenty-four* during the score of years 1851 to 70, 22.5 in the decade 1871 to 80.

During the intermediate period, 1880 to 1887, already noted, the death rate sank to 20.4 and in the year 1887 for the first time fell below 20 (19.5). Broadly speaking, we may say that in eighty-seven years it fell 9.7 points or 0.11 per annum. Now during the last twenty-one years it has fallen another 5.2 points, or 0.25 per annum, until last year it stood at 14.3 in a thousand. In other words, since the discoveries of the causative agents of disease, and the utilization of the knowledge thus gained the *diminution of the death rate in London has been accelerated more than twofold.*

Weighing everything carefully, it is impossible to ascribe this greatly accelerated reduction to causes other than the advance in public and personal hygiene brought about by the outburst of research and discovery regarding the causative agents of infective disease during the late seventies and early eighties of the last century, and the increasing knowledge of the modes of infection and of prevention of the same that these discoveries brought in their train. That this reduction in mortality will continue at the same rate is not possible. Only a certain proportion of the total mortality is due to the infectious diseases. Could we wholly banish these, we should not banish death from our midst; the individual still must die from other causes. But these same considerations render the figures I have given all the more remarkable. As we reduce the number of deaths from preventable causes each reduction of one in a thousand means a greater and greater effort, and, notwithstanding this, the reduction has during the last twenty years continued at twice the rate of that occurring during the previous eighty years.

I have taken London as my example, because it is the city which combines greatest population with best hygienic conditions and lowest mortality during the greater part of the last hundred years. Had I selected New York, the figures would have been yet more striking. Here the de-

crease in the death rate during the last twenty-five years has been practically six in a thousand (5.89). But at the same time they would have been somewhat exaggerated in that there was not in New York to anything like the same extent that preparatory period of progressive reduction in mortality due to an enlightened enforcement of legislation, which, while primarily directed to secure the increased well-being of the individual citizen, simultaneously reduced his liability to infection.

Tuberculosis.

But it is when we come to consider individual infectious diseases and the means now being taken to arrest them, that we obtain the most striking demonstration of the beneficent influence of the great pathological discoveries of the nineteenth century upon preventive medicine. Naturally the first of these to be considered is that which among us stands preeminent both as causing disease and swelling the death rate. It is a matter of familiar knowledge to all of you that among the peoples of the temperate zone tuberculosis stands *facile princeps* among the enemies of mankind, causing roughly one seventh of the deaths from all causes. It is well known to you also that post mortem examination reveals naked eye evidence of either active or arrested tuberculosis in the majority of autopsies at all periods of life and in those who have died from all forms of disease, the frequency increasing progressively until the thirteenth year is reached. My own series of autopsies at the Royal Victoria Hospital at Montreal upon some 1,400 cases has yielded to Dr. Landry evidence that 45.5 of the total afford such macroscopical evidence of the disease, or, if certain doubtful indications are also included, a little over 51 per cent. Statistics from the crowded industrial centres in the old world give yet higher figures, as do also routine microscopical examinations of the peribronchial, peritracheal, and mesenteric lymph glands; so that it would seem that there is no very great exaggeration in the statement that every one has his bit of tuberculosis; even if fortunately for us the majority are able successfully to hedge in that bit and render it harmless.

Lastly, every medical student knows that Koch announced the discovery of the tubercle bacillus in March, 1882, and that in 1884 he published the extended account of the researches which led up to and confirmed that discovery. I doubt if in any science there exists a more elaborate, more painstaking and thorough research than is revealed in those pages of the second volume of the *Mittheilungen aus dem kaiserlichen Gesundheitsamte* with their demonstrations of how the tubercle bacillus is to be detected in the tissues, how the germ may be grown in pure culture, and the record of the hundreds and hundreds of animals of different

species laboriously studied, both for the presence of the tubercle bacilli in their tissues and for the results of inoculation of pure cultures of the bacillus in setting up the disease.

So elaborate and so thorough a research it was as to establish instant conviction. From 1884 onwards the medical world was forced to accept the tubercle bacillus.

But very few of us know, and still fewer realize nowadays what that discovery has meant not merely for the medical outlook upon phthisis and other forms of tuberculosis, but also for practice. One has not to be very old to be able to remember the medical events of the eighties, but I take it that others have the impression (as I had) that the discovery came naturally enough with years of preparation in which the medical profession was coming round to the opinion that tuberculosis is an infectious disease. Secure in the possession of this exact knowledge that the tubercle bacillus is to be gained from every focus of active tuberculosis, we are only too ready to admit the evidence that earlier workers had brought forward regarding the infectiousness of the disease. We cite Isocrates, Avicenna, Fracastorius, Morgagni, and others as recognizing the fact, we quote the disinfection ordinances of Naples and other Italian towns in the eighteenth century. We adduce Villemin's masterly experiments of 1865 upon the experimental production of tuberculosis in rabbits, and the even more convincing observations of Cohnheim and Salomonsen in 1877, in which, placing tuberculous material from man in the anterior chamber of the rabbit's eye, they were able to see and follow the development of tubercles upon the iris. We forget that all these observations had practically no abiding influence upon medical action; that accepted by some they nevertheless did not become part of general teaching and general belief; that others afforded other explanations; that as regards Villemin's and Cohnheim's experiments, Talma, Aufrecht, and Lebert in Germany, Empis and Metzquer in France, Burdon Sanderson, Wilson Fox, and Klein in England brought forward such apparently overwhelming evidence to show that pus and foreign matter, and portions of healthy and diseased tissues of a nontuberculous nature would produce identically the same effects; that accurate as we now know these experiments to have been they did not convince. We know now that prior to Koch, Baumgarten had seen the tubercle bacillus, but he had not isolated and grown it and studied its properties. Not one of these observers had afforded a demonstration absolutely conclusive. That was left to Koch and his must be the credit.

As a matter of curiosity I have during the last few days glanced through a series of the more popular textbooks of medicine, published

between 1845 and 1882 to recall what was the ordinary and accepted teaching regarding tuberculosis. And I can say that until one does this it is impossible for any one to realize the revolution that Koch's discovery has brought about. Whether it be in regard to ætiology, to the morbid anatomy of the process, the relationship of the different manifestations of the disease, or the treatment, everything is vague and hesitating, where it is not, as we now know, incorrect. If anything, there is increasing vagueness as we approach 1882 and that largely because of Virchow's erroneous teaching regarding the nonidentity of caseous pneumonia with other forms of tuberculosis and its intimate relationship to catarrhal pneumonia. One and all, English and French and German textbooks lay stress upon hereditary diathesis and the strumous constitution as the basis of the disease. Most admit that it may arise *de novo* in an individual showing no signs of the diathesis, and then in consequence of improper nourishment, impure air, unhealthy occupations, low temperature, and want of sunlight. In the very year of Koch's discovery, Peters, professor of internal pathology in the Paris Faculty and member of the Academy of Medicine (*Leçons de clinique médicale,* second edition, II, 1882), who devotes some 600 pages to the subject of tuberculosis and more than 200 to its ætiology, denies its contagious nature, regards Villemin's conclusions as non-proven, and the tubercle as an evidence of a vice of nutrition and due to the loss of vital energy.

It is, you will find, always the case that when the exciting cause of a disease is not known, teachers and writers dwell with emphasis on all the predisposing causes. And on the whole these writers of the first three quarters of the nineteenth century were quite accurate in their enumeration of these predisposing causes, even if they were uncertain as to the relationship of the one to the other and to the actual disease. Nay, more in these latter days from the attitude naturally assumed after the first discovery of the specific pathogenic microbes—the attitude of ascribing everything to the microbic factor—we are coming round to realize more and more that it is the summation of *two* factors, of the resisting powers or relative susceptibility of the organism and the relative virulence of the micro-organism, together with the number of the latter gaining entrance into a particular area at a particular time, that determines whether infection is lighted up. We must be prepared to see, therefore, that progressive improvement in general hygiene during the nineteenth century had a definite effect upon the mortality from tuberculosis. Better housing, better conditions of work, better ventilation of house and workshop, better wages and consequent better nourishment of the mass of the people, all had their effect in reducing the ravages of the disease. But

think what it has meant to preventive medicine to know with absolute certainty that the disease is infectious; that infection is conveyed by the bacillus; that these bacilli cannot thrive and multiply at the ordinary temperature, but only at body temperature or thereabouts, and that consequently every case of the disease must be derived directly from a previous case; that the bacilli are discharged in enormous numbers in the expectoration of phthisical patients and may be found in teeming millions in the milk of cattle with tuberculosis of the udder; and that, consequently, infection is from man to man or from cattle to the drinkers of raw milk, namely to young children; that the bacilli easily killed by sunlight may persist for long weeks and months in a virulent state in dark rooms. These facts supply the data for prevention of the disease; they afford the data for the solution of the problem.

We see here the same process at work as was noted in connection with the general mortality rate. You must forgive me if as a British subject I tend to refer to British statistics best known to me. With improved general hygienic conditions of the mass of the people, even before anything was known regarding the tubercle bacillus, the reduction in the death rate from phthisis in England and Wales was very remarkable; that dropped from over *thirty-eight* in 10,000 living in 1838 to slightly over *eighteen* in 1884. Since then there has been a distinct acceleration in the fall. What can be accomplished is, however, best shown not by taking the general death rate but by employing the figures from cities in which the disease has been combatted systematically by measures logically deducted from the data furnished by Koch's discovery.

You all know New York's proud showing under the firm but beneficent mastery of your Board of Health led by Dr. Hermann M. Biggs, and how greatly the death rate for tuberculosis has dropped during the last ten years. But even more striking figures are afforded by Edinburgh, a much smaller city, where the populace is more homogeneous, more docile, and more intelligent than the illiterate swarming mixture of European immigrants, which crowding into the tenement house quarters of your city, forms so hard a nut for your health officials to crack. To Dr. Philip is due the thorough development of the Edinburgh dispensary system, which, acting in conjunction with the city health authorities and strengthened by compulsory notification makes it possible to deal with every recognized case of tuberculosis. There the deaths from tuberculosis have fallen to a remarkable extent. As Dr. Philip points out, we may divide the last twenty years—or more accurately the period from 1886 to 1906—into two equal periods. During the first of these necessarily the direction of antituberculosis effort was rather in-

definite. Even when, as in Edinburgh, the antituberculosis effort had assumed more definite shape, time was needed before the effect of effort began to register itself in the death rate. In brief, whereas from 1887 to 1896, the fall in 10,000 was 2.5 (from 19.5 to seventeen in 10,000), from 1897 to 1896 the fall in 10,000 was from nineteen to eleven. The percentage reduction in the first ten years was 12.82, in the second ten years 42.1. These are remarkable figures. We may say that in the last ten years there has been a greater reduction than in the previous fifty years. The effect of exact knowledge, gained by experiment, is indubitable.

Malaria.

The other great scourge of mankind affords even more striking testimony as to the effect upon the public health of pathological discovery. We, living in the temperate zone, are apt to forget that there is a disease more terrible and more widespread than tuberculosis. It has been said that one half the mortality of the human race is due to malaria. This, I am inclined to think, is an exaggeration, but when, as Shipley points out, in 1892 out of a total population of India of 217,255,655, the deaths from all causes reached the figure of 6,980,785, and of these 7,000,000 odd 5,000,000 were due to "fever," and fever in the tropics is known to indicate most often malaria, the statement is perchance not so very far from the truth. This same would seem true of China, with its innumerable millions, and all here know the ravages of the disease in Central and South America. Nor need I remind you as next door neighbors of Long Island and New Jersey that the disease is not confined to the tropics. What is of equal importance is that where the disease is not fatal it profoundly affects the vitality and power of the individual for long periods, causing listlessness and incapacity for active work. Of the British soldiers in India three out of seven suffer from an annual attack of malaria; of those on the west coast of Africa each individual suffers on the average from two attacks each year; the loss in energy and effectiveness is singularly great. A recent writer, W. H. T. Jones, of Cambridge, has brought forward a considerable body of evidence from classical writers that, more particularly, the decay of Greece and probably also the decline and fall of the Roman Empire coincided with the introduction and general spread of malaria through the valleys of the Grecian peninsula and through the hitherto fertile and populous Campagna around Rome and other low lying regions of Central and Southern Italy. The striking alteration in the character of the inhabitants of the Island of Mauritius, brought about by the introduction and universal spread of malaria since the year 1866 strongly supports this view.

That the disease especially haunted low lying and swampy districts had been known for centuries—as also that it was particularly dangerous to travel about in marshy regions after nightfall. As the name malaria implies, a miasm was supposed to be exhaled from the damp ground and to cause the disease. It was found that drainage of an infected district materially reduced the incidence of the disease. When I was an undergraduate at Cambridge there were still those living who remembered when it was dangerous to open the windows at night in certain parts of the town on account of the ague from the neighboring fen which might result. That fen, like all the marshes of the fen country, has long been drained and neither in that district nor in any other part of England has there been endemic malaria for long years. Drainage similarly and occupation of land has banished the endemic ague from regions in the northern States, like that around Detroit, where within living memory malaria was terribly rife. Procedures of this order coupled with the proper and adequate use of quinine have in various parts of the world materially reduced the incidence of ague, although where these precautions have not been adopted the disease has continued its depredations with undiminished vigor. Here again we see that prior to the remarkable series of discoveries bearing upon the causative agent of the disease preventive measures were in force and had a definite effect. The discovery by Laveran in 1880 of the hæmamœba in the corpuscles, important as it was, had little immediate effect, save to afford indications for treatment of the individual case; for studying the cycle of forms it was found that quinine was most effective upon the free amœbæ as they developed from the liberated spores. That discovery did not throw light upon the mode of infection. Nor again, deserving it is of remembrance, did the admirable paper of Dr. King, of Washington, in 1883, in which he showed that the mosquito must be the carrier of malarial infection, have any influence upon preventive medicine, save as preparing us to accept the absolute demonstration when it came. Only in 1897 did the researches of Captain Ronald Ross solve the mystery and immediately demonstrate how the disease is to be prevented. All are now familiar with Ross's work—how first he found peculiar accumulations of parasitic type in the walls of the stomachs of mosquitoes of a particular species that had fed upon the blood of malarial patients; how unable to procure sufficient human material he turned his attention to a similar blood parasite in birds and found here that another species of mosquito acted as the intermediate host; how making use of W. G. MacCallum's observations upon the sexual union between the flagella and free amœboid corpuscles of an allied parasite in the removed blood of Canadian crows

he recognized the existence of a sexual cycle of these parasites in the stomach and tissues of the mosquito, and concluded that a similar series of stages occur with the malarial organism of man sucked up by the anopheles; how, in short, he concluded that this mosquito was the carrier of the disease from individual to individual; how the correctness of these conclusions was demonstrated by the younger Manson, who in malaria free London, became infected by the bites of mosquitoes which had fed upon ague patients in Rome, and had been transported for the purposes of this experiment; and how the life history of the human malarial parasite, or more accurately, parasites, was worked out along the same lines by Grassi, Bastianelli, and Bignami, in Italy. Here now, at last, we knew how malaria was acquired and immediately it became evident how it was to be prevented—either by guarding the individual from being bitten by the anopheles, or better by preventing the anopheles from breeding, and so exterminating these mosquitoes.

The results of preventive measures adequately carried out have been extraordinary. Take for example the instance of Ismailia in Egypt. This is a town of about 6,000 inhabitants, principally employees of the Suez Canal Company, founded by Baron de Lesseps in 1862. In 1877 a fresh water canal was constructed to supply the town with drinking water, and with that an ideal breeding ground for mosquitoes was afforded. Almost at once malaria appeared and since then malaria has steadily increased until 1902 when the mosquito campaign was inaugurated. We obtain the following figures:

Year	1898	1899	1900	1901	1902	1903	1904	1905
Cases	1545	1784	2250	1900	1548	*214*	*90*	*37*

In this last year Dr. Pressat the official medical officer reported that there were no new cases of infection; the disease was killed out, and that by one mosquito brigade consisting of four men acting under the medical officer.

In Port Swettenham, in the Malay States, the same brilliant results have been obtained. Here was a new tropical settlement, surrounded by marshes in which the anopheles bred abundantly, and having an annual rainfall of 100 inches—a swamp of the most pernicious order. Within two months of the opening of the port in 1902 forty-one out of the forty-nine government quarters were infected and 118 out of 196 government servants were ill. Now, after filling up all pools in the settlement for a space of 440 yards all around, and clearing the jungle, no single officer has suffered from malaria since 1904, and the number of cases among children fell from 34.8 to 0.77 per cent. The only sufferer at the present time is the enthusiastic District Surgeon, Dr. Malcolm Watson, whose

main income gained from attending malarial cases has dropped to practically zero.

But what is the use of telling to an American audience what drainage, oiling the water, and the use of mosquito netting has brought about? You all must be familiar with the triumphant work of the mosquito brigade at Havana, the yet greater triumph if possible—as regards malaria—of Colonel Gorgas and his corps on the Panama Canal. It was not graft—bad as that was—but the mosquito that brought ruin to the French project. You know that long as is the national purse and great as is the national pride it would be impossible for the States to carry the canal through the Isthmus but for the preventive guard of the medical department, and for that noble army of trained workers which has brought it to pass that the death rate in the Canal zone is now less than that of the city of New York. That the daily sick rate is only about seventeen in a thousand has been obtained almost wholly through mosquito prophylaxis.

Yellow Fever.

Speaking of mosquitoes one naturally passes to consider that other scourge which has been absolutely proved to be conveyed by this insect, namely yellow fever. Here again the facts must be so familiar to you that it is only necessary to refer to one or two salient points. Once more we see that observation led thoughtful members of the profession, like Finlay, to recognize the mode of infection, but that it was well conceived experiments and the absolute data gained therefrom that preceded advance. There is no nobler chapter in the history of American medicine, no more triumphant demonstration of the beneficent results of pathological discovery than the history of the suppression of yellow fever in Havana. The episodes follow one another with such dramatic rapidity and inevitableness: First, Walter Reed's deduction that maturation of the unknown parasite in an intermediate host is necessary to explain the delay between the first and subsequent cases of the fever in a new locality; then by a process of exclusion the narrowing down of the probability to the mosquito; next the conclusive experiments by Carroll, Lazear, and the members of the Cuban commission when, under conditions excluding fallacy of observation, they allowed themselves to be bitten by mosquitoes (stegomyia), which days before had bitten yellow fever patients; the development of the disease in those so bitten; the death of Lazear; the establishment of the mosquito brigade in Havana; the immediate fall in the incidence of the disease, so that whereas in 1900 there were 302 deaths in the city, in 1901 there were only five, in 1902 none. Never, surely, has preventive medicine won so decisive a victory,

a victory, let me repeat, based upon the results of pathological research.

Other Infections.

In this way I might continue discussing disease after disease in which the results gained by scientific investigation have led to the adoption of practical means of prevention. I might, for example, discuss the extent to which a knowledge of the mode of life of the typhoid and colon bacilli have influenced the problems of pure water supply to great cities and give you figures showing the effect of filtration and what bacteriological studies have accomplished in this respect; might turn to the prevention of infectious disease among domestic animals and give you that early but fascinating story of how Pasteur and the French Commission, by studying the life history of the anthrax bacillus, solved the mode of infection, gained a means of causing immunity, and reduced the mortality from this disease in French sheep from over ten to under one per cent.; might discuss rabies and the studies upon preventive inoculation against this dread disease and the results of the same; might take up Fourth of July tetanus and how this is being reduced thanks to a knowledge and employment of methods of preventive inoculation gained from laboratory experiments; and, perhaps of wider significance than all of these, might dwell upon the reduction in diphtheria mortality directly due to the brilliant researches of Behring and Roux upon diphtheria antitoxine. But after this recital of the effects of pathological discovery as applied to the extirpation of yellow fever, the data that I could give you, important as they are, would, I imagine, produce somewhat the effects of an anticlimax. Let me, instead, in conclusion attempt to draw together the reins of this discourse.

Conclusions.

We see in the first place that in ignorance of the causative agents of infective diseases earlier generations sought after the predisposing causes; that such predisposing causes cannot be neglected as factors determining whether the individual does or does not succumb to infection; and that as a result the more accurately these predisposing causes are determined and the fuller the measures taken to guard against them, the greater in general is the lessening of the death rate.

But, in the second place, it is obvious that once through exact research the exciting cause of a disease becomes determined, its life history studied, and mode of conveyance from individual to individual becomes worked out, the public health problems in connection with the prevention of that disease assume a totally new aspect—vagueness gives way to clearness of vision; direct methods become possible, and the previous slowly progressive diminution of incidence and mortality have given

place to a rapid and in some cases dramatic arrest and extirpation of the disease.

Next, developing out of this, pathological discovery has taught the further lesson, that while certain general principles govern the incidence of all infections and so certain general measures must tend to lessen the incidence of infectious disease in general, nevertheless, the more exact have been the studies into the life histories of pathogenic organisms, the more surely have we learned that each specific micro-organism has characters distinguishing it from all the rest, and as a result that each disease induced by these agencies must be proceeded against by special means; each disease brings with it particular problems to be solved. It is these special means rather than broad general measures that afford the ultimate complete triumph.

Finally, I would urge that there is a danger that must be guarded against in a recital such as this: The danger of satisfaction, the danger when contemplating what has been accomplished, of neglecting to consider the abundance of what is still to be achieved. To you at Columbia I would emphasize that what has already been done is as it were little more than the fringe of what is still to be done. Even in this one department of public health work—that of controlling the incidence of infectious disease—there is a vast achievement still possible. In 1907 (and I doubt whether 1908 showed any very striking differences) 30,000 individuals died in New York from preventable causes. It is not too late for some at least of those here present to determine to devote themselves not to the treatment, but to the prevention of disease, confident that their efforts, by research and by the application of the results of research to the problems of public health, they can during their life time save a greater number of lives by following the profession of Preventive Medicine than they could by direct treatment of those already the victims of disease.

Do not think that in making this reference to New York I am seeking to disparage what has already been accomplished in this city. That is very far from being my object. The work accomplished by Dr. Hermann M. Biggs and his coadjutors during the last fifteen years is in every respect remarkable, and is worthy of, and is receiving, the attention and commendation of those interested in public health throughout the civilized world. But let me impress upon you that it is carried out under most unsatisfactory conditions. These conditions, it is true, make the personal triumph of your health officials all the greater. With problems so vast to be tackled, you in this city, if I am informed aright, do not pay a single one of the heads of your Health Department sufficient to

allow him to devote his life and energies to this great work. On the contrary you afford stipends so miserable that perforce those on whom you depend have to engage in private practice to keep body and soul together. What has been accomplished has been due to the self-sacrificing enthusiasm of these men. Nay, your present policy absolutely prevents any sane man undertaking preventive medicine as his life's work. Who would seriously prepare himself to make preventive medicine his profession, when being appointed to office his continuance in the same is dependent upon the continuance of one or other political party in power. These matters, I hold, must be taken out of the field of party. Permanency of position is essential for the development of a properly qualified body of health officials and, for the good of the country as a whole, the matter should not be left to the separate States but should, at least, be directed and controlled by the federal authorities.

I am no socialist, but, on the contrary, appreciate that point of view which leads the individual to select some work in life in which he can regard himself as his own master, independent of trusts, and can strive to do good work in the world along his own lines. I have little sympathy with the aspirations of those who would see the state becoming the monopolist in all forms of industry and endeavour. Nevertheless, looking to the future, I cannot but see the time approaching, and approaching rapidly, when the good of the community will demand that an important section of the members of our profession shall be servants of the state, their work devoted, not to the cure, but to the prevention of disease. That time has already come in Great Britain, where since 1892, there has been developed a body of trained and certificated specialists, of medical men whose whole time is devoted to preventive medicine.

Despite the difficulties imposed by State, as distinct from federal, rights and privileges, it is inevitable that a like development shall take place here in America. The national weal demands that either the States combine, or the federal authorities impose common action and a common system, in dealing with zymotic diseases, diseases which do not respect State boundaries and State prerogatives, which, from their liability to become widespread are matters of national concern. It is, for example, a matter of national and not of State concern that the plague has become enzootic in certain Californian rodents. National health is above the prerogatives of the individual States. And as the control and eradication of preventable disease becomes more and more effective, so will the duties and the emoluments of the ordinary medical man become less and less, the responsibilities of the preventive officer greater and greater. There will—there must always—be opportunities for independent en-

deavour: The general practitioner, like the poor, must always be with us: the natural multiplication of the people; accidents calling for the trained surgeon; diseases of special regions demanding the care of the specialist; the common neurasthenic; the chronic invalid; must always demand individual care. But as a community, we shall have to follow the Chinese fashion to a very definite extent, and establish an order of physicians whose remuneration shall be proportioned to their success in keeping us from getting ill.

Nor, when we come to consider the matter, is it one whit less noble or less satisfactory to become a servant of the public than it is to be an independent professional man. In the first place, save as a mental attitude, the independence of the practitioner is largely a fiction. Proud as he is of that independence, in reality he is throughout the twenty-four hours of the day, the servant and, indeed, the slave of the public. No one more so. We professors who appear to have greater freedom are servants of the university, and after long years of experience find that that service is not irksome. Nay, the more loyally we accept the yoke the greater do we find our freedom. And that is always so. We have but to regard the attitude and the standing of those foremost servants of the public, the officers of the army and navy. Where could we find greater self-respect, greater respect for those higher in authority, greater delight in loyal service for the good of the community than in those two services?

There is thus a beneficent future before the Federal Public Health Service. I would urge those before me to recognize that the development of a common health service for the whole Union is an end that all should work earnestly to attain—a service with trained officers in charge of every city and district throughout the length and breadth of the land; a service independent of politics; a "third service" with ideals every whit as noble, if not nobler, and aspirations equally lofty, if not more lofty, than those of the other two—the service of the army of the common weal.

And once again I would urge some at least of my hearers to think seriously of joining the staff and of becoming leaders in this army: of devoting their energies, their talents, and their lives to this great and beneficent department of preventive medicine.

SURGICAL TUBERCULOSIS.

BY

E. M. VON EBERTS, M.D., M.R.C.S. (Eng.)

Surgeon to the Out-patient Department of the Montreal General Hospital.

I would preface my remarks upon those clinical forms of tuberculosis which are included in the category of surgical affections, by expressing my thanks to the Executive of the Canadian Hospital Association, for their courtesy in extending to me an invitation to address this meeting.

During the past few years a vast amount of thought and energy has been expended by governments, federal, provincial and municipal, by charity organizations, by church societies and district visitors, by hospital authorities, both lay and professional, and by bacteriologists of note, in the perfection of methods for the detection and care of those suffering from pulmonary tuberculosis and for the protection of the community at large. As the impelling force in this vast movement had its origin in the recognition of the transmissibility of this disease, I have been impressed with the scant attention generally accorded tuberculous infections other than pulmonary, viewed in the light of their undoubtedly infectious nature.

The treatment of pulmonary disease depends for its success primarily upon the carrying out of certain hygienic and dietetic measures, and, owing to the vivid illumination of this phase of tuberculosis, the results achieved have probably been better on the whole than those obtained in the treatment of such surgical infections as have not been subjected to radical operative measures. I can not help thinking that this lesser success is a direct result of the failure to apply to the treatment of surgical infections the regimen prescribed for pulmonary cases,—rest, forced feeding and outside air.

As a starting point let us review the ward history of the average case of tuberculous hip-joint disease complicated with sinus formation. As soon as possible after admission to the general surgical ward, that is as soon as the routine connected with acute operative cases and the exactions of emergencies permit, the individual is skiagraphed and the necessary fixation or extension apparatus ordered by the attending surgeon: dressing of the sinus is carried out and the diet prescribed. Then follows an indefinite period of unavoidable delay while the apparatus is being selected or made, during which time the patient lies in the general ward and partakes with his fellows of the best air which the location and season or the ventilating equipment provides—air which is doubtless of a standard of purity sufficiently sustaining to the average individual not suffering from tuberculosis. If it be during the cold weather, the patient

An address given before a meeting of the Canadian Hospital Association in Toronto, April 12, 1909.

is allowed to remain night and day in the public ward. At other times orders are given for him to be placed on the verandah during the day. To what extent are these orders carried out? Daily dressings are necessary, but, as we all know, in large general wards there is no fixed period at which this function is carried out, especially the dressing of chronic cases. Frequently the residue of daylight is too small to warrant the patient's removal to the gallery that day. In short, instead of the patient being brought in for dressing, he waits in for dressing. During the winter months, owing to the lack of proper protection, he objects to remaining out all day—probably the solitary occupant of the verandah, and the fresh-air order of the chief or house-surgeon is not infrequently waived in the face of these remonstrances. On the other hand, if the order is enforced, the nurse finds the exposure a hardship, especially where a two-hour temperature has to be given, and the practice is no doubt occasionally responsible for minor ailments among the nursing staff,—an additional influence tending to keep the patient indoors.

Again, if the discharge from the sinus or sinuses is profuse and curetting is necessary, for which an anæsthetic is administered, there is a temporary withdrawal of the normal food supply, and for some days, while in a lowered state of resistance, the patient is confined strictly to the ward.

The appetite gradually dwindles in spite of an extensive list of extras upon his diet card. Still later he becomes anæmic and a chalybeate is prescribed. Interest in his own progress perceptibly wanes until the chief joy of this "chronic" is the advent of an "acute" and only an ambulance case can rouse him to an elbow posture,—a state of mind which reflects very truly his depleted physical condition. In this way the winter months are dragged through,—with improvement, it is true, but an improvement which does not balance with our actual knowledge of how such cases should be treated nor our skill in treating them.

The patient whose history we have reviewed is much in the position of one of the impounded herd of Tolstoi's parable, in which a multiplicity of ukases enjoining the sowing of grass seed, the building of protecting sheds, the washing of udders and, finally, daily grooming, proved ineffectual in staying the gradual decrease in the milk supply, as the cardinal essential—the levelling of the palings—was withheld. What these animals required was fresh browse; what our patients require is outside air.

This element, air, is concerned in all forms of ventilation; it is to be found of a standard of purity suitable for therapeutic purposes, however, only on the outside of the four walls of the hospital ward. There it is

"outside air," not to be enticed through the ventilators of double windows or forced through ventilating shafts. In other words "outside air" can not be imported.

How can we best eliminate in the conduct of cases of this kind, the odd ends which tend to invite failure or at least a postponement of recovery? I am of the opinion that the first step in this direction must be the provision of special and separate accommodation—an open pavilion or verandah equipped with canvas shields for protection against unsuitable weather conditions, where patients will be constantly in the fresh air. During the colder months dressings should be carried out in a heated apartment adjoining. The nurses in charge of the ward should be suitably clad for the season. An orderly should be always promptly available for the shifting of beds.

At night the patients should be moved into a comfortably heated ward, as it is probably Utopian to hope that the average individual may be induced to spend a winter's night in the open air, although I am personally convinced that with a proper equipment only comfort and an exalted feeling of well-being result from this procedure. As a matter of fact, to carry out open air treatment during the day in cold weather requires such a special equipment—that is an impervious mattress (preferably of felt), flannelette blankets instead of sheets, a Jaeger or four-point blanket, an eiderdown duvet and, occasionally, a hot-water bottle. The patient should wear flannelette pyjamas, warm socks, a warm bed-jacket and a light woollen tuque. It is very essential that the coverings should be light. A weight of bed-clothing is most irksome and detracts from the benefits of the treatment. If protection against wind is provided, the equipment described is ample for winter weather where the temperature is 10° F. or higher. Too much stress can not be laid upon the quality of the mattress. The patient can heat only one surface, and with most economy of heat energy that which lies beneath. Light coverings provide for proper body ventilation. The bed-clothing should be secured by means of blanket safety pins along one side and across the foot of the bed.

Under the plan proposed the serving of the mid-day meal during the colder months would be the chief obstacle. At this season breakfast and the evening meal could be served indoors, and with sufficient assistance I am satisfied that the serving of the mid-day meal would not present insuperable difficulties.

Every precaution should be taken in the disposal of infected material. How frequently one sees tuberculous material, such as caseating glands, joint curettings, or dressings from sinus cases, treated as ordinary in-

fected material and disposed of in the ordinary dressing tins, instead of being destroyed in the furnace! These casual methods show as little regard for the community, inside and outside, as the disposal of sputum by way of the sink.

In the regulation of the diet of this class of patient we are far in the wake of the physician. It is not enough to prescribe a liberal diet; it is necessary to see that the patient gets what is prescribed, that it is served in a palatable form, and finally that it is consumed. I am confident that a liberal Providence, through the medium of a generous public, leaves little to be desired in the quality of the raw food stuffs supplied to our hospitals, but the source of cooks is a moot question, and I have often felt on inspecting the product of his or her art, as served in the hospital ward, that the patients partaking thereof were trusting largely to the uncovenanted mercies. There are undoubtedly good cooks abroad in the land, but unfortunately Hospital Boards of Management are apt to hold that a high-priced cook is out of place in a charitable institution. Tuberculous subjects, above all others, require not only food in abundance but food which is properly cooked and served in an attractive form. These patients, in addition to three full meals a day, should be given at least half a pint of milk between breakfast and the mid-day meal, at three o'clock in the afternoon, and before lights out. Raw eggs may be added. Such an extensive diet can be accepted only by those who are constantly in the outside air.

In order to appreciate the effect of fresh air and liberal feeding, the patients should be weighed once a week, and, as suggested by Doctor Joseph Pratt of Boston, improvements in weight should be posted at regular intervals as an incentive to those who cavil at the forced feeding and out-door regimen.

While apart from operative measures the essentials in the conduct of these cases are rest, liberal feeding and fresh air, we have in tuberculin a valuable adjuvant. My personal experience has been chiefly with the use of that form known as Tuberculin Rest or the T. R. of commerce, administered in doses varying from 1/3000 to 1/800 of a milligram, according to the body weight, at intervals of ten days to two weeks,—the treatment extending over a period of six months to one year.

Where sinuses exist, there is always superadded pyogenic infection, which can best be combatted by the administration of an homologous bacterial vaccine.

With the expansion of a knowledge of the use of tuberculin there has been a marked diminution in the number of localized surgical infections subjected to operative interference. Until comparatively recently exten-

sive resection of tuberculous glands was practised as a routine method. At the present time a large proportion of these cases are selected for treatment by more conservative methods and with decidedly better results. In the treatment of joint infections the resections of yore have been largely replaced by the employment of fixation apparatus, the use of Bier's bandage, puncture followed by the application of Klapp's suction cups, and the routine administration of tuberculin. Tuberculous peritonitis is now less frequently treated by incision and drainage; rest in the open air and a liberal diet offering in the majority of these cases a less unfavorable outlook.

In the treatment of surgical tuberculosis it is only a question of time when our hospitals will have to grapple with the family side of the problem. Bread-winners will not progress favorably if their minds are not relieved as to the maintenance of those dependent upon them. Mothers also must know that their children are not being neglected.

When discharged from the ward all patients, whether receiving tuberculin or not, should be instructed to report regularly at the out-patient department, and those failing to do so should be referred to the district nurse for investigation. Cases of localized tuberculosis should not be allowed to return to the conditions under which the disease was contracted without an effort being made to discover and eliminate the source of infection or the predisposing factor, whether the latter be an undesirable occupation, insanitary housing, or a defective food supply. I would go a step further in expressing the opinion that all cases of localized tuberculosis should be reported. If such a process were legally enforced, these cases would be brought immediately under the eye of the civic authorities and the Tuberculosis League, and I am confident that in many instances evidence of infection in other members of the household would be detected. It is only by such careful supervision that relapses or metastases may be recognized early, that permanent cures may be effected, and that that millenium may be looked forward to when tuberculosis shall have become a comparatively rare affection.

There is nothing new in what I have put before you. The various ideas here assembled have all passed through the crucible of criticism and emerged as truths which may now be safely engrafted upon the Tree of the Art of Healing. The method of treatment outlined would, I believe, lead to a very material curtailment of the average time of retention of these patients—an achievement most urgently to be desired and yielding a three-fold blessing; a lessening of the tale of suffering; an earlier resumption of wage-earning, education or domestic duties; and a broadening of an institution's scope of usefulness.

A STUDY OF ORGANIZED PLEURAL ADHESIONS AND THEIR RELATIONSHIP TO TUBERCULOSIS, BASED ON AN ANALYSIS OF 1374 CONSECUTIVE AUTOPSIES.

BY

A. R. LANDRY, M.D., and J. GEORGE ADAMI, M.A., M.D., F.R.S.

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There has, of late years, been very considerable discussion regarding the diagnostic value of acute pleurisy as an indication of tuberculosis, there being those who hold that the majority of cases are tuberculous, while others dispute the point.

Pleural adhesions, it need scarce be said, have their starting point in an acute or subacute pleurisy, and following the suggestion of Professor Adami, I made a full analysis of 1374 consecutive autopsies performed at the Royal Victoria Hospital to determine, as far as the material permitted, the incidence of systemic tuberculosis and other relationships to pleural adhesions.

That material was peculiarly favourable for the purpose. In the first place it constitutes a larger series than any I have been able to encounter in the literature. The number of autopsies performed at the Royal Victoria Hospital is not great, averaging less than three a week, so that there is leisure for thorough study and record of individual cases; the whole series has been performed under the supervision, and according to the methods of one pathologist: these methods have, from the first, involved a conscientious tabulation of every recognized deviation from the normal, common conditions, such as pleural and peritoneal adhesions, being recorded with as much care as are the more obvious causes of death. The notes are made by a student or interne at the time of autopsy, and then dictated in a definite order to a stenographer. The material is that of a large general city hospital, consisting in the main of medical and surgical cases. The notes to be made regarding that material as an adequate or defective index of Canadian mortality are that the number of infants and children under twelve, admitted to the hospital, is well below the average of the general population; that chronic long-standing cases of disease gain entrance to the wards with difficulty, and that cases of active pulmonary tuberculosis are not knowingly admitted into the medical wards, save rarely, and then, as it were, under protest. The majority of cases coming to autopsy are derived from the medical and surgical wards: the gynæcological, ophthalmological and laryngological beds supply very few. In all these respects the hospital is a typical city hospital: the majority of patients come from the city of Montreal, but

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a large minority gain entrance from the surrounding country. Some come from distant parts of Canada, and from across the border from the neighbouring states of Vermont, New York and New Hampshire. Lastly, as a seaport town, there is somewhat above the usual percentage of "outlanders" of both sexes.

In 1895, when the series of autopsies began, there were admitted into the Royal Victoria Hospital 1,841 patients, and in 1907 4,044 were admitted. In 1907 the average number of patients in the Hospital per diem was 224, of which 74 were medical, 95 surgical, 28 gynæcological, and the remaining 27 are accounted for in the ophthalmological, laryngological and otological wards.

I have carefully gone through the notes of the 1,374 cases, and before discussing my results, it is necessary to call attention to the limits to be placed on the accuracy of the record. In the first place only organized adhesions are taken into account. Of these one group is not included in the table, and this because I could not convince myself that they had always been noted: I refer to interlobar adhesions. The time for viewing pleural adhesions in general is when making the preliminary inspection of the thorax. When interlobar adhesions alone are present, these may easily be overlooked at this period, and fail to be recorded later. Secondly, it must be kept in mind that the diagnosis of tuberculosis has been based purely on naked eye examination. It is true that in a large percentage of cases in the routine examination of sections of, on the average eight, major organs of the body the diagnosis has been confirmed under the microscope and again in a smaller proportion by bacteriological methods. This table, however, is based upon gross appearances. Those tubercles, invisible to the naked eye, in the cervical and other lymph glands, have not been taken into account. Similarly, mere puckering of the apex of the lung, with no other gross sign of tuberculosis, has been ruled out from our main tables of tuberculosis, unless associated with this there were definite underlying calcified or fibroid tubercles. The minute subpleural fibroid tubercle-like bodies, which Hodenpyl regards as true arrested tubercles, have also been placed under a separate column. We are inclined to believe that both of these conditions are indications of old pleural tuberculosis, but as they represent border line conditions, have thought it wiser to place these cases in a definite category, along, we would add, with those cases in which rare solitary small shot-like calcareous bodies in the liver or spleen have been the only tubercle-like lesions discovered.

Yet another point deserves attention. It is evident and natural that certain observations at first made perfunctorily, are later pursued more

keenly, as their importance becomes more fully realized. Thus, for example, in the early half of this period, when attention had not been drawn to the frequency of a solitary focus of tuberculosis in the peribronchial glands, or more particularly in the gland cluster at the bifurcation of the trachea, it is probable, nay certain, that the presence of the disease there was not infrequently overlooked. To the more frequent detection of obsolete tuberculosis in these regions, we would, in the main, ascribe the difference between our figures and those contributed to this Congress by Dr. J. McCrae: our series embraces some four hundred more recent reports, which are not included in his analysis.

It goes without saying, that our figures are well below what we are convinced is the actual amount of tuberculosis in our material. Lastly, the notes have permitted us to recognize the following main orders of pleural adhesions:—

(1) Generalized, affecting one or other lung.
(2) Scattered or sporadic.
(3) Apex free, but occasional adhesions below and in front.
(4) Adhesions separated with difficulty.
(5) Those that the slightest touch would destroy.

Next, as to the results obtained.

I. *Frequency of old pleural adhesions.*—Of the 1,374 cases, 990 or 72.1 per cent. are recorded as exhibiting adhesions of one or other degree. 384 or 27.8 per cent, as free from adhesions. These figures, I may note, are closely in accord with those determined by Lord, of Boston. In a smaller series of 215 autopsies (about $\frac{1}{6}$ of ours), he found 74.4 per cent. of adhesions. In other words, *in the North Eastern portion of North America, it may safely be laid down that seven out of ten adults exhibit indications of a previous pleurisy.*

II. *Age incidence.*—I hope later to publish this table in full. Here I would merely quote McCrae's figures: viz., that the average age of case coming to autopsy was 46 for the first 1,000 cases, and there is no reason to believe that our next 374 cases would change this average to any material extent.

III. *Relationship of systemic tuberculosis to old pleural adhesions.*—Of this series of 1,374 cases, 558 (40.6) afforded definite macroscopic evidence of tuberculosis in the thoracic cavity. 68 other cases showed evidence of tuberculosis, according to our classification, either in the mesenteric glands, liver, spleen or bones.

Thus summing up, we have undoubted tuberculosis in thorax:—558 cases (40.6 per cent.). Cases showing tuberculosis elsewhere than in the thorax, 68 cases, or 626 cases of tuberculosis in 1,374 cases (45.5 per cent.).

If fibrosis of the apex with no other macroscopic lesion be counted as tuberculous (89 cases), we then have 715 cases of tuberculosis, a percentage of 52.

Here it must be understood that we deal with obsolete or obsolescent tuberculosis, or again with progressive tuberculosis of a more chronic type. It is scarce necessary to point out that acute miliary tuberculosis, devoid of any sign of an older focus of primary infection, is not here taken into consideration, and that because an acute tuberculosis cannot account for old pleural adhesions.

A. *Cases of tuberculosis* (*other than acute miliary*), *showing no old pleural adhesions.* — Of the 384 cases showing no adhesions (27.8 per cent. of total), evidence of tuberculosis was found in 103 cases (26.8 per cent.). In other words, in cases without adhesions, 26.8 per cent. have suffered to some degree from tuberculosis. Of these, the site of the tuberculosis was in the thorax in 82 cases (21.3 per cent.), not including 9 which showed merely apical fibrosis, and the tuberculosis was elsewhere (alone) in 21 cases.

In other words, as might be expected, not all cases of thoracic tuberculosis are accompanied by pleural adhesions.

It must be obvious to all that the 27.8 per cent. does not represent merely those that never suffered from pleurisy, for there may be perfect resolution of an acute pleurisy, no adhesions being formed, nay more, we have to recognize, and in this view we are confirmed by experiments on the dog, that organized adhesions may undergo eventual absorption. On the other hand, it is worthy of note that characteristically the more extensive the pulmonary tuberculosis the more common are the pleural adhesions, and that absence of adhesions especially characterizes limited and obsolete tuberculosis, and more particularly these cases in which the peribronchial or peritrochial lymph nodes alone are recognizably involved.

B. *Cases of tuberculosis that were accompanied by old adhesions.*— Of 626 cases of tuberculosis or 45.5 per cent. of the 1,374 cases, 523 showed adhesions, or 83.5 per cent., as against 990 cases of adhesions, in which 523 showed tuberculosis variously distributed (52.3 per cent.).

If, on the one hand, 103 cases showed evidence of tuberculosis with no coincident adhesions, there were, on the other hand, 523 or 83.5 per cent. of cases of tuberculosis with adhesions, or, roughly, five cases of tuberculosis are accompanied by adhesions to every one that shows none. The only figures bearing upon this point that I can refer to are those of Dr. J. McCrae, communicated to this Congress, based upon the first thousand of this series from which similar conclusions are drawn. (Out of

these 1,000 cases, Dr. McCrae found 24 without adhesions, but with pulmonary tuberculosis, 11 with tuberculosis of the thoracic nodes lymph nodes, 6 with tuberculosis of both lung and thoracic nodes. He does not consider the cases in which the only recognizable tubercular lesions were outside the thoracic cavity.) He concludes that out of 239 cases of early (or more accurately slight obsolete and latent) tuberculous infection, 50 cases show no direct relationship between the lesion and pleural adhesions, or, roughly, nearly one out of every five.

There is another and converse ratio to be determined, namely, the proportion of cases of old adhesions that afford coincident indications of tuberculosis in some region of the body. Of the total number of 990 cases of adhesions, 523 showed tuberculosis, or 52.3 per cent. *Or to put this clearly, while five out of every six cases of visible tuberculosis are accompanied by adhesions, only one out of every two cases of adhesions exhibits obvious coincident tuberculosis.*

This is a very striking result, and one that must be taken into serious account in the estimation of the diagnostic value of pleurisy in general. If we can draw any conclusion from the analysis, it is that there are two roughly equal groups of cases of pleural adhesions and presumably, therefore, of pleurisy: one in which there is associated tuberculosis; the other in which all naked eye indications of that disease are wanting.

What value is to be placed upon this conclusion ? Can it be said with any plausibility that they cannot be accepted: that in the cases showing no tuberculosis there had been a primary tuberculosis which had undergone complete absorption, the pleural adhesions being the sole remaining indication: or again that microscopical examination would have revealed tuberculosis in these cases and that the naked eye diagnosis is valueless? This second argument may be dismissed rapidly. It has been shown that the adhesions are characteristically related to the extent of the tuberculosis and that small foci, but still recognizable to the naked eye, are time and again present with absence of adhesions. We may safely conclude that a tuberculosis so slight and so latent as not to reveal itself to the naked eye is little likely to be the cause of the often extensive adhesions met with in this group of cases. And as regards the first argument it is difficult to believe that the absorptive process sufficiently active to remove all obvious foci of the specific disease, would not, in general, remove even more effectively these non-specific organizations.

Making every allowance, it is still, I am inclined to think, impossible to escape the conclusion that there are approximately two equal orders of cases of pleural adhesions.

How are we to harmonize these results with those that have been gained

by clinicians and bacteriologists bearing upon the tuberculous nature of the majority of cases of clinically recognizable acute pleurisy? I am of the opinion that if they cannot be reconciled, at least, an explanation is possible of the divergence.

Let us note first that clinically recognizable acute pleurisy is a relatively rare event, compared with the occurrence of pleural adhesions. To give an example: at the Massachusetts' General Hospital, Lord, out of 18,543 patients examined, found that acute pleurisies had been diagnosed only in 2.4 per cent. of the cases. Osler quotes a series of 19,396 cases at the Pennsylvania General Hospital, as affording 505 cases of this condition, or 2.6 per cent. Similarly, Würzburg clinics in thirteen years had an incidence of 3.4 per cent., although the Charité, at Berlin, in 8 years gave 9 per cent. Compare these figures with our 72.1 per cent. of observed old adhesions in 1,374 autopsies. Clinical notes are generally silent where the adhesions over one or both lungs are at autopsy found dense or universal.

The conclusion is inevitable that only a small proportion of cases of pleurisy in the acute stage yield clinical symptoms. It is this proportion, I would suggest, that is represented by the cases of acute pleurisy with effusion. We must freely accept such figures as those of Aschoff, that 68 per cent. of the animals inoculated from cases of serous pleurisy succumbed to tuberculosis, and even those of Le Damany, that 86 per cent., or even 96 per cent. of the exudates in such cases induce tuberculosis in the animals of the laboratory.

We admit thus that acute serous pleurisy is most often of tuberculous origin—and that it leaves adhesions behind it. But just as in the peritoneum we recognize that adhesions may follow acute inflammation set up by B. coli or streptococcus infections, just as we believe that appendicitis with its subsequent adhesions is by no means necessarily of tuberculous origin, so here on broad general principles we must accept these figures and the conclusions to be derived from them that *pleural adhesions are surely of more than one origin, and that they fall into two groups: the tuberculous and the non-tuberculous.*

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THE CAUSATION OF SEX.

Dr. E. Rumley Dawson has recently published a book from the house of Mr. Lewis, London, in which a new theory of the causation of sex is put forward. It must be admitted that the book is written in a spirit of polemic.

It is dedicated to the memory of "a medical martyr," and is inscribed with the legend, "there is nothing more thankless than the attempt to influence any field of public opinion." This is too gloomy. Indeed, it is not true. To become a martyr does not prove that a man is right. Dr. Dawson's claim that he has "discovered Nature's secret," must be determined not by the persecution at which he hints, but by other considerations entirely.

This new theory is that the sex of the fœtus is not due to the male parent, but depends on which ovary supplied the ovum which was fertilised and so became that fœtus. It is claimed that a male fœtus is due to the fertilisation of an ovum that came from the right ovary and a female fœtus is due to the fertilisation of an ovum that came from the left ovary. The book contains an amplification of this view and maintains that the male parent has no influence whatever in the causation of sex, which rests entirely with the female.

According to this theory the female has in the right ovary ova which are already sexed male, and in the left ovary ova which will produce only females after fertilisation. So far as we are aware this is the first occa-

sion upon which the male has been entirely dissociated from any influence in determining the sex, though there has always been a tradition that the right side was in some way concerned with the production of males, and the left with the production of females. It was the opinion of Hippocrates that the secretions from the right sides of both parents produced males and Galen offered the explanation of this phenomenon that the right side was warmer. Upon this assumption various mechanical devices have been suggested to govern the sex from the time of Avicenno to that of a writer in the "*Lancet*," in 1870, who signs himself T. B. The case for the right side, however, is not strengthened by the citation of the fact that men have better sight with the right eye, women better with the left, that men have the buttons on the right whereas women have them on the left side of their clothes, and that men usually put their right arm first into their coats whilst women usually begin with the left. In the desire to be comprehensive, something of the trivial has been admitted.

The evidence is both precise and voluminous, and is clearly presented. A series of cases is given in which ten women gave birth to 48 female children and no males, each woman having had two husbands. This is followed by a series in which only males were produced, the conclusion being that the women were unilaterally sterile. There is a body of anatomical evidence to show that menstruation takes places from each side alternately accompanied by the discharge of a male and female ovum respectively, and the results of operations for extra-uterine pregnancy are cited to prove that the fœtus on the right side is always male and that on the left side female. The results of child-bearing after operation for the removal of one ovary would appear to yield confirmatory evidence. Dr. Dawson also affirms that in the bicornuate uterus the sexes occupy different sides. This view is now before the medical profession and it will doubtless be subjected to that relentless analysis which all new theories invite.

THE PROPOSED MEDICAL ACT.

The draft of the Medical Act of 1909 has been published, and while it is yet under consideration we might point out the manner in which the Province proposes to carry out our reciprocity agreements with the United Kingdom. Section 78 sets forth that a graduate of a university of France, upon showing evidence of having passed a proper preliminary examination may try his final examination for a license. Section 79 then goes on to say what follows:—

79.—Those whose names are inscribed in the Medical Register of the

United Kingdom of Great Britain and Ireland in pursuance of Imperial Medical or other acts amending the same shall be entitled, upon producing sufficient proof of such inscription and of their good conduct, and upon paying the fees then exigible for the obtaining of the practising license, to such license, without having to undergo any examination; provided they establish to the satisfaction of the Provincial Medical Board:

(1) That they have obtained from the Provincial Medical Board a "Brevet" or certificate of admission to the study of medicine, five years at least before their inscription in the Medical Register of the United Kingdom.

(2) That they were registered in the Medical Register of the United Kingdom and became qualified to exercise their profession in the said United Kingdom in the course of a period of not less than five years, during which time they must have resided without interruption in the United Kingdom.

We need scarcely say that should the enactment be made thus, the entire idea of reciprocity will be defeated.

LARGE WHITE OR SOAPY KIDNEY.

Dr. Oskar Klotz has published from the laboratory of the Royal Victoria Hospital in the "Journal of Medical Research," an important contribution entitled "On the Large White or Soapy Kidney." With him were associated in the work of investigation, Professor Adami and Dr. Bruère, to whom due recognition is made. The essence of the contribution is contained in the last paragraph in which Dr. Klotz explains, "that the large white kidney which we have usually considered as the fatty kidney is in reality a soapy kidney, and that part at least of the myelins contained therein consists of soaps of oleic acid." These fatty compounds are not readily demonstrated by the ordinary staining with Sudan III. They may, however, be recovered by chemical methods, and appear to be some of the so-called myelins. The communication is an interesting and useful one, not only as indicating a misapprehension under which we have labored with regard to the form of kidney lesion in question, but also as casting light upon the composition of the myelin bodies about which so little has been known. We are glad that this work of Dr. Klotz, as well as the previously published Harvey lecture of Professor Adami upon the myelins, came from our own laboratories.

Reviews and Notices of Books.

Schultze, Lehrbuch der Hebammenkunst, Vierzehnte, Verbesserte Auflage, mit 103 Abbildungen. Leipzig, 1908, Wilhelm Engelmann.

The first edition of Schultze's Manual for Midwives appeared in 1860; for 48 years it has been the standard work of its kind and has gone through 14 editions. The prefaces to eight of the editions are given, and enable us to judge how greatly the instruction given to midwives in Germany has improved in half a century. Many medical students use Schultze's book as a short compend of the essentials of practical obstetrics. It seems to have been brought fairly well up to date, and for the most part the directions given are clear and sound. Some new illustrations have been added from the text-books of Bumm and Piskacek. It is a pity that figures 57 and 58 illustrating the method of supporting the perineum in the dorsal and lateral positions have not been omitted; modern practice is decidedly opposed to such manipulations as being useless and sometimes harmful. Schultze's swinging for the resuscitation of asphyxiated infants, as shown in figures 93 and 94, is far too dangerous a method to recommend to midwives. The simpler measures in general use in this country are better and safer. Exception must be taken also to the Douche Nozzle shown in figure 101; it has the grave defect of having an opening at the point, and unless used with great care might readily do damage.

Applied Surgical Anatomy. For the use of students and practitioners of medicine, by George Woolsey, A.B., M.D., second edition; enlarged and thoroughly revised, with 200 illustrations, including 59 plates, mostly coloured. Lea & Febiger, New York and Philadelphia, 1908.

The increasing number of works upon this subject and the newer editions of the older works, show that teaching bodies as well as practitioners have come to recognize the necessity for their existence. Woolsey's Surgical Anatomy is well printed and bound, and a credit to his printer. The author has not hesitated to borrow freely in his illustrations from the well known works on anatomy, viz: Meckel, Zuckerkandl, Gerrish, and others; he has also added many excellent radiographs. The days of the "cut and tie" surgeon are fortunately disappearing. Surgical applied anatomy is becoming more and more popular as a compulsory course in the medical curriculum, and it is well that it is so. Professor Woolsey is entitled to our thanks for a very good book.

J. A. S.

700 Surgical Suggestions. By Walter M. Brickner, B.S., M.D., Eli Moschcomitz, A.B., M.D., Harold M. Hays, M.A., M.D. Third edition. The Surgery Publishing Co., 92 William Street, New York, 1909.

This little work contains not only the pith of the larger surgical works, but also the result of careful clinical observations which are, and can only be, picked up almost unconsciously as the result of long varied and faithful hospital experience. It is written in concise, terse, epigrammatic paragraphs which almost speak to the reader from its pages as the clinician does. It is thoroughly up-to-date and is concisely indexed under the various regional and subjective headings which is invaluable to the busy general practitioner, serving him accurately as a ready reference handbook upon questions of diagnosis, clinical signs and symptoms, prognosis and treatment, of exactly the very cases he is dealing with and aiding him in a practical way in the various difficulties which confront him from day to day.

The Operations of Aural Surgery, together with those for the Relief of the Intracranial Complications of Suppurative Otitis Media. By C. Ernest West, F.R.C.S., Aural Surgeon to St. Bartholomew's Hospital, and Sydney R. Scott, M.S., F.R.C.S., Assistant Aural Surgeon to St. Bartholomew's Hospital. H. K. Lewis, London. With fifteen plates and other illustrations. Demy 8vo. 7s. 6d. net.

The reasons for writing this book, the authors explain, are:—

1. The lack of anything like sufficient detail on the subject of operative procedures in the works on diseases of the ear hitherto published.

2. They have elaborated, in their practice, a number of original methods which having been found of such value by actual experience, they have taken this method of introducing them to others.

3. The want of an account of the methods which they themselves follow for the use of their students and house-surgeons.

In the introduction the subject of nystagmus is dealt with at some length with the different tests for labyrinthine disease, in connection with which some original observations are recorded. Among the new operations are opening of the labyrinth, styled by them "Vestibulotomy" and the operation for the drainage of the meninges, a procedure which, though adopted in a smaller number of cases, has been attended by sufficient success to warrant the hope that by such means, a proportion of the cases of otitic meningitis may be saved by prompt operation and that a condition hitherto beyond cure may be rendered amenable to treatment.

Limited space precludes more than a brief mention of these operations; for a further description the reader is referred to the volume under review.

The remainder of the book is devoted to the various operations in aural surgery, detail not being lacking; an appendix in which 46 operative cases are tabulated brings this instructive and interesting little volume to a close.

W. H. J.

THEORY AND PRACTICE OF INFANT FEEDING. By HENRY DWIGHT CHAPIN, A.M., M.D., New York. Third edition. Revised. William Wood & Co., Publishers, New York, 1909. Cloth, $2.25 net.

It is but a little over four years since the second edition of Dr. Chapin's book appeared, that now a third edition is demanded shows the continued popularity of this extremely useful little work. This third edition has been revised and the section on practical feeding has been greatly improved. In this section the author discusses the principle of "top milks"; very simple rules being given for the employment of this means in obtaining a percentage modification.

Section thirty-four, dealing with standardized gruels, is completely new. The effect of these gruel diluents is to soften the curds and thus allow the digestive tract more easily to perform its function. The author in this section endeavors to establish cereal feeding on a scientific basis. He has had a number of different varieties of gruels analysed to determine their composition particularly as regards the relative proportion of tissue-building and heat and energy-producing elements they contain. He has thus succeeded in compiling interesting tables giving the approximate percentage of gruels made from cereals and from flours. This portion of the book is extremely interesting and will repay careful study.

With regard to alkalies the author states that when it is desired to prevent or retard the action of the gastric secretion on the milk, then an alkali is indicated; but for the majority of infants it is desirable and proper to let the stomach perform its function and increase in digestive capacity.

Chapter twenty-two on the "Preparation of Food" is practically new, having been re-arranged and much new matter added. In it whey and cream mixtures, percentage composition, and peptonized milk are dealt with.

In chapter twenty-three, which is also new, the author takes up the subject of foods for difficult cases and for temporary use. For instance,

he gives a series of foods suitable for cases that fail to thrive on fresh milk modifications. References are made in this chapter to condensed milk mixtures, and whey mixtures.

It is a matter of surprise that the author has not said more about buttermilk, having given but two paragraphs in section 153 to the discussion of its employment in infant feeding. He states that it is suitable only for temporary use, which is surprising when one considers the mass of literature which has recently appeared lauding the use of buttermilk in infant feeding.

Formulæ for the preparation of food mixtures containing no milk are given in full, suitable for cases where temporary milk intolerance is present. These additions will easily be seen to add not a little to the practical value of Dr. Chapin's interesting and useful manual on infant feeding. It is a work which is undoubtedly one of the most valuable contributions on the subject, and should be carefully read by those called upon to prescribe food mixtures for infants and young children.

MODERN MEDICINE. ITS THEORY AND PRACTICE. In original contributions by American and foreign authors. Edited by WILLIAM OSLER, M.D., Regius Professor of Medicine in Oxford University, England; formerly Professor of Medicine in Johns Hopkins University, Baltimore; in the University of Pennsylvania, Philadelphia, and in McGill University, Montreal. Assisted by THOMAS MCCRAE, M.D., Associate Professor of Medicine and Clinical Therapeutics in Johns Hopkins University, Baltimore. In seven octavo volumes of about 900 pages each, illustrated. Volume V, Diseases of the Alimentary Tract. Price per volume: cloth, $6.00, net; leather, $7.00 net; half morocco, $7.50 net. Lea & Febiger, Publishers, Philadelphia and New York, 1908.

The fifth volume of this work deals with diseases of the alimentary tract, and is a book of 903 pages, uniform with the preceding ones. The volume very properly begins with a general discussion of the physiological pathology of the processes of secretion by Dr. Charles G. Stockton, of Buffalo. While the title proper is an introductory discussion on the diseases of the digestive apparatus, this takes the form of a brief and readable survey of the most important facts connected with digestion. The article is properly placed, and well written; an occasional lack of definiteness in the paragraph titles is not reflected in the text; for example, 'The Question of Secretion' scarcely conveys enough meaning. These twenty pages well reward the time employed in reading them. Dr.

David Riesman, of Philadelphia, contributes the article upon diseases of the mouth and the salivary glands, and covers much ground in a series of concise paragraphs; such an article as this is eminently suited to the needs of a practitioner. Dr. John McCrae, of Montreal, contributes the paper upon the diseases of the œsophagus, and Dr. Julius Friedenwald, of Baltimore, that upon the functional diseases of the stomach. The writer deplores the very unwieldy classification of these diseases that at present exists, but must of necessity employ it. The greatest objection that the practitioner can offer to this article is that he cannot tell which of the many subdivisions is the one he requires, unless he be fairly well read on contemporary literature of the diseases of the stomach. We admit that we do not see how Dr. Friedenwald can help this; rather are we all the victims of a refinement of distinction that has become extreme—there are too many functional diseases, so-called, of the stomach, and the lack of variety in the treatment of the various forms of functional derangement shows that no one appreciates this more than the writer.

Dr. C. F. Martin, of Montreal, deals with the organic diseases of the stomach. Gastric and duodenal ulcer and cancer occupy seventy-five pages; the importance of the surgical treatment of these diseases is fully recognized, as is fitting at the present time. In writing upon acute gastritis the author has evidently experienced the difficulty that exists in determining what cases of gastric derangement are cases of acute gastritis, and has adopted a very conservative standpoint. The same is true of his treatment of chronic gastritis, for there is a tendency to use these terms loosely in describing cases where no lesion exists. Gastrectasis, however, rests on a surer basis, and its treatment is especially well described. After the discussion of the comparatively rare diseases congenital pyloric stenosis and cirrhosis of the stomach, there is a practically useful discussion of hæmatemesis.

The diseases of the intestines are dealt with by Dr. Alfred Stengel, of Philadelphia, and this forms an excellent chapter. The physiology of the intestines, of intestinal mobility and of the fæces are followed by a comprehensive but not long description of the bacteriology of the tract. Various deviations from the normal such as hæmorrhage, colic, etc., are followed by a useful chapter on constipation. The various forms of diarrhœa, of enteritis and colitis are given, and a discussion of appendicitis, sensible at all points, follows. The unwieldy subjects of ulceration and obstruction are taken up in a thoroughly adequate way.

Dr. H. D. Rolleston, of London, takes up the diseases of the peritoneum and, as would be expected, produces a highly-finished article,

replete with a knowledge of the literature of the subject and with abundant references. The parts dealing with subphrenic abscess and tuberculosis of the peritoneum are to be specially commended. Splanchnoptosis is dealt with by Dr. Thomas R. Brown, of Baltimore, who is well qualified to write upon a subject which has engaged his attention for a long time. As perhaps might be expected, his convictions tend towards the recommendation of medical rather than surgical treatment in the majority of cases. When it is stated that the diseases of the pancreas are in the hands of Dr. Eugene L. Opie, of New York, it will be admitted that no one is better qualified, and the article bears all the marks of first hand information.

The wide subject of the diseases of the liver and of the gall bladder and biliary ducts is in the hands of Dr. A. O. J. Kelly. It occupies less than 175 pages, and the writer has done well in expressing so much in so comparatively small a space. We heartily agree with Dr. Kelly's adoption of the most simple classification that is possible of the cirrhosis of the liver, and pages 757 and 758 contain a very clear exposition of the truth about some of the vexed points. We do Dr. Kelly's article less than justice in saying that it is good. In fine, volume V of the system is first class.

A Treatise on the Principles and Practice of Gynæcology. By E. C. Dudley, A.M., M.D., Professor of Gynæcology in the Northwestern University Medical School, Chicago. Fifth edition, thoroughly revised. Octavo, 806 pages, with 431 illustrations, of which 75 are in colors, and 20 full-page colored plates. Cloth, $5.00 net; leather, $6.00 net; half-morocco, $6.50. Lea & Febiger, Publishers, Philadelphia and New York, 1908.

Five editions of Dudley's Gynæcology in ten years is a remarkable showing for the popularity of a text-book. Those who have known this book and recommended it to students did not need this piece of evidence to commend it to them. As the publishers say, " ability to live and thrive despite competition, which is surely abundant " indicates a strong book. In his introductory chapter the author puts forth a strong plea for the existence of gynæcology as a specialty on the grounds that to the gynæcologist was due the first of the modern extensions of abdominal surgery and to the indubitable fact that a long special training in physical diagnosis is necessary to make the safe and successful practitioner in the diseases peculiar to women. These opinions were put forward in the author's presidential address at the Annual Meeting of the American Gynæcological Society in 1905 and were intended to combat an idea be-

ginning to prevail in certain quarters that gynæcology is being merged into general surgery.

There is probably no department of medicine in which so many text-books are written and this book of Dr. Dudley's is certainly one of the best. One important feature of the work claimed by the author to be unique is the consideration together of the infections of the organs and tissues concerned. Thus, vulvo-vaginitis, metritis, salpingitis, oophoritis, peritonitis and cellulitis are considered in succession. Infections of these organs and structures may exist separately or, in a severe case, all may coexist from extension. This method of dealing with the subject we believe to be a distinct advantage over the more usual way of considering all the affections; for instance, infections, neoplasms, displacements, of an organ before proceeding to those of another organ or structure. In noticing a new book, or a new edition of an old book, one naturally turns to the author's discussion of rival methods of procedure to see what he has to say. First, as regards the abdominal and vaginal avenues of approach for operation; after a full discussion of the merits and advantages of each, the author very wisely concludes that " the operator should not permit his prejudice of either route to lead him to pursue it to the extreme, for that part of an operation which is easy by the vagina is often more difficult by the abdomen and *vice versa*." And another debated or debatable question is the modern radical abdominal operation for cancer of the uterus. Here again the author's attitude is remarkably judicial and conservative. Dr. Dudley's book is very copiously illustrated. Obsolete illustrations of previous editions have been eliminated and many new original drawings have been added.

W. G.

STUDIES IN PARANOIA. — Nervous and Mental Disease. Monograph Series No. 2. By N. GURLICH, M.D., and M. FRIEDMANN, M.D. Translated and edited by Smith Ely Jelliffe, M.D., New York, 1908.

This, the second number of this excellent series of monographs, is a worthy successor to its forerunner already reviewed in these pages. It takes up some of the less common forms of paranoid conditions, especially those forms without delusions having a favourable termination. *Ipso facto* these cases would not be included among the paranoias by Krœpelin, but clinically and practically they cannot be distinguished, save perhaps from the fact that there are no delusions—which in the early stages of the disease at least would be an uncertain factor to base a prognosis on. They are well worth reading, the translation being fluent and easy.

SUGGESTIVE THERAPEUTICS; APPLIED HYPNOTISM; PSYCHIC SCIENCE. By HENRY S. MUNRO, M.D. Americus Georgia, second edition. Published by C. V. Mosby, Medical Book and Publishing Company, St. Louis.

It is with a distinctly pleasurable disappointment one reads this book, the appearance of the pages with the emphatic words in large heavy type suggest the sensationalism one too often finds in treatises on this subject. It is therefore delightful to find a reasonable, scientific method of dealing with this subject, and if one makes allowance for a certain amount of enthusiasm, recognizing it as a necessary adjunct in the successful practice of psychic science, one reads the book not only with interest, but with considerable profit.

DISEASES OF THE EYE. By STEPHEN MORGAN, F.R.C.S. Henry Frowde, Oxford University Press, 1908.

The author in his preface presents this little work as one intended to help those who are beginning the study of ophthalmology, or as a short work of reference for the general practitioner. As such this volume will certainly serve its purpose well. It is a clear, concise presentation of the subject following the generally accepted ideas, although several of the more recently introduced methods with which the author has had practical experience are included.

The section on diseases of the fundus oculi is dealt with rather briefly, as in the writer's opinion those who are sufficiently advanced in the subject as to be able to use the ophthalmoscope should consult larger works for reference. Elementary optics and refraction are treated in an unusually interesting manner, the brevity of description assisting naturally in an intelligent appreciation of a rather difficult branch of ophthalmology.

One point in particular in which the work is to be commended is the admirable and liberal manner in which the book is illustrated. Mr. Morgan as a pathologist has appreciated his particular advantage over writers of the majority of small text books, and, in addition to a clinical picture of diseased conditions, has prepared a large series of microscopic sections which very naturally assist in demonstrating the morbid changes occurring in the various ocular disorders. The way in which the book is printed and the number as well as the quality of the illustrations would do credit to a more pretentious volume.

An appendix giving a number of the commoner prescriptions used in eye surgery, as well as the indications calling for their employment, lends an added value to this little book. The work will be welcomed by the

student who wishes a brief yet intelligent conception of ophthalmology before he has occasion to resort to the larger treatises.

F. T. T.

Epoch-Making Contributions to Medicine, Surgery, and the Allied Sciences, Collected by C. N. B. Camac, A.B., M.D. The W. B. Saunders Company, Philadelphia and London, 1909.

This book contains a series of reprints of those communications which first conveyed most important observations to the scientific world, together with biographical sketches of the observers, with portraits. It is dedicated to Lord Lister, apparently at the recommendation of Professor Osler according to the facsimile letter which forms the frontispiece. The papers which are printed are: "On the Antiseptic Principle of the Practice of Surgery," by Joseph Lister; "Circulation of the Blood," by William Harvey; "On Percussion of the Chest," being a translation of Auenbrugger's treatise by John Forbes, M.D.; "Auscultation and the Stethoscope," by R. T. H. Laennec; "Vaccination Against Smallpox," by Edward Jenner; "Anæsthesia," by W. T. G. Morton; "Puerperal Fever," by O. W. Holmes.

So far as we are aware this is the first occasion upon which the original accounts of the seven cardinal discoveries in medicine have been brought together, and the wonder is that the happy inspiration did not impel some one to do it sooner. There is nothing more important for the student than to go to original sources and this book affords him a ready method. The portraits add to the interest and the biographies are comprehensive and accurate. The book will be a refreshment to all who have much to do with the reading of modern books on medicine.

Disorders of the Bladder with Technique of Cystoscopy, by Follen Cabot, M.D., Illustrated. New York, E. B. Treat & Company, 1909.

A book which aims to teach the technique of cystoscopy to the general practitioner is likely to fail. Whilst we may admit that "the recent improvements and reduction in cost of the instruments have brought them within the reach of all," it does not follow that "all" should use them. The practice of cystoscopy is one of the most special in surgery and should only be exercised with great caution to make it safe for the patient or useful to the practitioner. There is, however, much other information in the book dealing with urinary conditions, all well arranged and presented.

BACTERIAL FOOD POISONING—the So-called Ptomaine Poisoning, by PROF. DR. A. DIEUDONNÉ, translated and edited with additions by DR. CHARLES FREDERICK BOLDUAN. New York, E. B. Treat & Company, 1909. Price, $1.00.

Prof. Dieudonné's book on Bacterial Food Poisoning was published less than a year ago and this is the first translation which has been made. The editor has added a description of additional outbreaks of food poisoning in America and has slightly rearranged the material. The book which contains 128 pages is divided into ten sections. A transcription of the titles of these sections will give some notion of the extensive contents of this little book. These headings are: Poisoning Through Fish and Molluscs; Poisoning Through Cheese; Poisoning Through Ice Cream and Puddings; Potato Poisoning; Poisoning Through Canned Goods; Metallic Poisons; Bibliography. This last is especially valuable. The book is a thoroughly scientific one and interesting as well.

PROGRESSIVE MEDICINE: Vol. XI, No. 1, March 1st, 1909. Lea and Febiger, Philadelphia.

The contents of this volume are: The surgery of the head, neck and thorax, by Charles H. Frazier, M.D.; Infectious diseases, including acute rheumatism, influenza and croupous pneumonia, by Robert B. Preble, M.D.; The diseases of children, by Floyd M. Crandall, M.D.; Rhinology and laryngology, by D. Braden Kyle, M.D., and Otology, by Arthur B. Duel, M.D. The number contains 270 pages and is a complete record of the progress in the various divisions of medicine which it deals with. We note a reference to Dr. Browne's clinical observations on epidemic Cerebro-Spinal Meningitis, in this JOURNAL, and to Dr. Blackader's tabulation of cases observed in the Montreal hospitals, also in this JOURNAL. We note also a reference to Dr. White's case of death from Typhoid Fever due to excessive toxæmia without ulceration of the intestine. These illustrations are given to show how well the field has been gleaned. The section on Otosclerosis is especially interesting. This series is most valuable and the present number is one of the best we have seen.

PRACTICAL DIETETICS, by ALIDA FRANCES PATTEE. Fifth edition. A F. Pattee, publisher, New York, 52 West 39th Street.

On at least three occasions we have mentioned this book and always with praise. It remains now merely to call to the attention of both nurses and physicians that a fifth edition of this very practical Dietetics has just appeared. Many of the prescriptions, or recipes, as one should say, are as alluring to the well as to the sick.

MANUAL OF OPERATIVE SURGERY. By JOHN FAIRBAIRN BINNIE, A.M., C.M. (Aberdeen), Professor of Surgery, Kansas State University, Vol. I, Operations on the Head, Neck, Nerves, Trunk, Genito-Urinary System. Fourth edition with 713 illustrations. Philadelphia: P. Blackiston's Son & Co. Price, $3.50 net.

In this, the fourth edition of this valuable manual there are marks of thorough revision. The chapter dealing with the nervous system has been re-written; the chapter on renal operations has been enlarged and more freely illustrated; the chapter on orthopædic surgery and the veins will be included in a companion volume which is now in course of preparation. Notwithstanding these enlargements the author believes "that the volume can be slipped into a coat pocket without too much injury to the clothing." It is not clear, however, why one should want to put a manual of surgery in his pocket. In these 800 pages the methods to be employed in the various surgical operations are presented with such singular clearness as convinces one that the author is a surgeon as well as a writer. The letterpress is admirable and the illustrations are fresh, clear, and pleasing.

Medical News.

JOURNAL CLUB.

The annual general meeting of the McGill University Medical Journal Club was held on January 27th, 1909, in the Peter Redpath Library. There were present: Drs. Archibald, president; Nicholls, secretary; Howard, treasurer; Gardner, Birkett, Fry, Morrow, Klotz, Orr, Turner, Byers, and Russel.

The reports of the secretary and treasurer were received and adopted.

The secretary reported a prosperous year. The Club was going cautiously and its expenditure was well within its income. The usefulness of the Club had, nevertheless, been considerably extended. The following journals were added to the fyles during 1908: Folia Hæmatologica. Folia Serologica, Folia Urologica, Neurological Journal, and Archives d'ophthalmologie (continued).

In view of the fact that the secretary's duties were largely nominal, Dr. Klotz moved, and Dr. Nicholls seconded, that the positions of the secretary and treasurer be united in one person. Carried.

It was decided to subscribe for the Archiv für Schiffs-und Tropen Hygiene, and the Mittheilungen aus der Grenzgebiete für Medizin und Chirurgie, and the committee were empowered to consider the advisability of adding several other journals to the list.

The election of officers resulted as follows:—

President—Dr. E. W. Archibald.

Sec.-Treas.—Dr. C. Howard.

Executive Committee — Drs. Nichols, Klotz, and Russel, with the president and secretary-treasurer.

The report of the treasurer is appended.

ASSETS.		LIABILITIES.	
Carried forward from 1907....	$ 72.60	Bal. due for journals 1905.....	$ 2.92
Subscriptions due from 1906..	14.00	Bal. due for journals, 1906.....	9.27
Subscriptions due from 1907..	24.00	Bal. due for journals, 1907.....	54.32
Subscriptions due from 1908..	96.00	Stamps	5.00
New subscriptions for 1908...	28.00	Journals for 1908.....	123.13
Presented journals	14.13		
Bank interest.....	3.39	Total	$194.64
		Bal. in bank Jan. 25th, 1909...	57.48
Total	$252.12		$252.12

C. P. HOWARD,
Treasurer.

CANADIAN MEDICAL ASSOCIATION.

For the forty-second annual meeting of the Canadian Medical Association in Winnipeg, on the 23rd, 24th, and 25th of August, 1909, transportation arrangements have been completed. For delegates, their wives and their daughters (no others), from points east of Port Arthur the rate will be single fare plus twenty-five cents for round trip tickets, provided fifty or more are present holding Standard Convention Certificates. These tickets will be on sale from August 14th to 21st, final return limit from Winnipeg Sept. 25th. If Ontario Lake route is used payment of the following arbitraries must be paid to the pursers of the Richelieu lines: During August, Toronto to Montreal $8.00, from Kingston to Montreal $4.50; during September, from Toronto to Montreal $6.65, from Kingston to Montreal $3.50. Upper Lakes: going $3.50 additional, returning $8.50 additional. Side trips from Winnipeg one fare for the round trip, August 25th to September 24th inclusive. Alaska-Yukon-Pacific rates will apply for side trips announced in the annual circular issued in June, or July 1st. Local Convention plan arrangements will prevail for the West as far west as Laggan and Coleman, Alberta. Lowest one way first-class fare from B.C., date of sale of tickets being August 16th to 19th inclusive, with final return limit September 25th.

Dr. Max Klotz, of Ottawa, has gone to England and the Continent, where he expects to spend eight or nine months in study.

A new home for tuberculous patients has been opened in the outskirts of Gravenhurst, on the shores of Lake Muskoka. The Minnewaska hotel has been purchased by Mrs. Fournier, a Canadian nurse who has achieved distinction in the United States, and the patients will be under the professional care of Dr. Charles D. Parfitt. They may be assured of intelligent nursing and proper medical supervision.

Dr. Arthur C. L. Fox, of Montreal, died on March 31st, at the Royal Victoria Hospital, in his 45th year. He graduated from McGill University in 1898, since which time he practiced his profession in the city. During his earlier years he was an oarsman of repute in Western Canada.

Dr. Dixon, of Frankville, Ont., died of appendicitis on March 18th. He had for some years carried on an extensive surgical practice in the country around, and was noted as one who kept thoroughly abreast of the advances made in his profession.

J. K. Niven, a graduate of McGill, 1901, passed away at his home in London, Ontario, on the 30th of March.

Society Proceedings.

THE MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The eighth regular meeting of the Society was held Friday evening, January 22nd, 1909, Dr. J. Alex. Hutchison, President, in the chair.

D. A. Shirres showed a living case of hysteria simulating cerebral tumour.

C. K. Russel, M.D. These extremely interesting cases that Dr. Shirres has just shown make one wonder what the real nature of hysteria is; how these so-called functional diseases can imitate so closely organic lesions of the brain and cord. One often wonders if there is not some underlying really organic condition, although we cannot see it under the microscope, and if it is not some vaso motor condition that from its nature cannot be demonstrated under the microscope. With these hysterical patients one notices that there is usually great vaso-motor instability, they blush readily, and we get dermatographia and other evidences of this and I often wonder if there is not some similar vaso motor disturbance occurring in the brain or cord causing these symptoms that

simulate a definite organic disease so closely. Hysteria in a man of this patient's age is certainly rare in this country.

FOREIGN BODY BETWEEN THE INNER AND OUTER TABLES OF THE SKULL TWENTY-FIVE YEARS.

A. R. Pennoyer, M.D. The patient before you to-night is a young man 28 years of age, who came to me last June with a little nodule over his right eye, which felt very much to me like a sebaceous cyst. The history was that for seven or eight years this had bothered him a good deal at different times. During the early part of this period it would disappear for some little time only to reappear again. Since last winter, however, the lump has enlarged in size and has not subsided. On excision of this little lump I found that it ran down apparently into the bone. I ruptured it and there was an escape of a thick, yellow purulent matter much like that from sebaceous cysts and I concluded that it must be of the nature of a dermoid. I cauterised this, but a sinus persisted resisting all methods of cure for about two and half months. Having failed to close the wound I gave him a general anæsthetic, exposed the bone and found in the frontal bone a punched out opening which would readily admit a large sized probe. On exploring this I found it led into a cavity between the outer and inner tables of the skull and contained dark gritty material which we thought to be sand or gravel, at least this was the conclusion which we came to after going further into the history. It seems that 25 years ago when a child three years old he was run over by a heavy loaded wagon and sustained an extensive scalp wound, the scar of which can still be seen, hence the conclusion that for 25 years this road gravel had lain here, causing this abscess which had communicated with the parts underlying the skin. In a week's time the wound was entirely healed. An interesting thing, however, is that there is a little nodule forming a short distance from the former one just as this one did seven or eight years ago and it will be interesting to find if this turns out to be a similar abscess to the one just cleared out. He has a slight anæsthesia in the area of the supra-orbital nerve as the result of the operation.

C. W. Duval, M. D. The sand-like material was sent to the pathological laboratory for diagnosis, and at the time I thought it might be a psammoma. However, on subsequent study, together with the fact that the granules were found between the outer and inner tables of the skull, I decided that it was not such a new growth. Still it must be borne in mind that another small swelling similar to the first one has recently appeared, which would argue in favour of its neoplastic nature, instead of sand-inclusions the result of accident received many years ago.

E. W. Archibald, M.D. I would like to ask one or two questions concerning points which are not clear to me. For instance, I do not quite gather from Dr. Pennoyer's description whether the cavity led only as far as the internal table or under it to the dura mater. Further, one would like to know whether this cavity contained granulation tissue or not, such as one would expect to find from an inclusion of gravel for so long a time in such a situation. With regard to tumours in this situation it is, of course, not common to find dermoids within the skull, but it is common to have dermoids in the outer layers, and in such dermoids it is not so very uncommon to have slight calcification. I would like to ask if there was any evidence of lime salts in the material examined.

A. R. Pennoyer, M.D. I might say that at the time of the operation I took particular pains to see if the cavity communicated in any way with the cranial cavity and we could definitely say that it did not, it lay inside of the outer table. Neither was there any evidence of granulation tissue; the lining of this cavity was almost ivory-like in appearance and a little irregular in outline, but the gravel, or this dark gritty material, came away and left it quite clean. The apparent discrepancy in position I would explain by the natural changes in relative position that would occur in growth, and also that at the time he had this injury there was a fracture of the outer table which was not noticed and some gravel was included. With regard to the lime salts I can only say from its gross appearance that it had not any of the characteristics of this at all.

PRIMARY TUBERCULOSIS OF THE BREAST.

E. M. von Eberts, M.D., read the paper of the evening.

E. W. Archibald, M.D. It is a little difficult to discuss such an exhaustive paper as that we have just heard, based as it is, too, upon a rather rare condition. Yet the hard work evidenced in its very thoroughness deserves at least an attempt at discussion. One or two points were to me of special interest. First, the classification. It seems to me that the term "primary tuberculosis of the breast" ought to be reserved for such cases as develop inside the gland itself. No case that involves the skin first and the breast secondarily can be counted in. I may be mistaken, but I thought that one or two of the cases quoted were of this nature. Another point concerns the question of tuberculin. I suppose that no one of us here present has such an extensive experience in the therapeutic use of tuberculin as has Dr. von Eberts; certainly I have not. With regard, however, to the question of tuberculin used for diagnosis, and particularly with regard to the point raised as to the local reaction at the

site of disease following subcutaneous administration, I would say that in my experience such a local reaction has been very rarely obtained. In the numerous cases in which I have used tuberculin as a diagnostic agent I have rarely found any inflammatory reaction at the site of the suspected lesion. A further point concerns the question of lactation. It is remarkable that, as Dr. von Eberts says, so many of the cases develop, or become acute, during lactation. Here we have a clear evidence of the ill effect of function upon the tuberculous process, just as clear, for instance, as when we see a latent infection of the knee become an acute one under exercise. There was sent to me some years ago by Dr. Kelly, of Almonte, Ontario, the specimen of a breast, the site of tubercular disease which was as he believed solitary, and primary in that gland. I was able to confirm his clinical diagnosis of primary mammary tuberculosis by microscopical examination. According to the history of the case, the condition became acute in the third week of lactation. It was found out later that she had had a nodule in the breast for some months previously. The removal of the breast cured the patient. There were no points in the history of this case to indicate a tuberculous lesion elsewhere. Tuberculosis of the breast is undoubtedly rare, yet, rare as it is, the necessity of accurate diagnosis is great, because, as Dr. von Eberts says, the treatment must be the same as for cancer in this region.

E. M. von Eberts, M.D. With regard to the classification; of course there are a very large number of cases of tuberculosis of the breast recorded, but in the majority there is a history of pre-existing tuberculous disease, and they can not, therefore, be considered primary. The only instance of direct infection which I have included in my series is the case of Pluyette where a wound of the nipple was followed shortly after by tuberculous disease. A similar case of direct infection was reported by Roswell Park.

With regard to the use of tuberculin for diagnostic purposes, I may say that my own experience has necessarily been very limited. What experience I have had has been chiefly in a negative way; that is to say I have administered tuberculin in one or two cases of tumors of the breast (fibromata) which were thought possibly to be of a tuberculous nature, without obtaining a reaction.

A CASE OF ANTHRAX.

G. T. Stephens, M.D., and O. S. Hillman, M.D.

G. Gordon Campbell, M.D. This case came to the dermatological department and made no complaints whatever of being ill; but asked to

have his eruption treated. On looking him over we found that he had lesions very similar to those of erythema nodosum except for their situation. I looked on it as a rare form of erythema multiforme, and knowing it is frequently due to sepsis in some part of the body I took his temperature and discovered that he had fever and a good deal of systemic disturbance. I do not know of any case reported where anthrax has occurred with the large number of lesions which this case presented, such lesions are almost invariably single. The lesions here were much smaller than the ordinary one in anthrax which has a great deal more surrounding induration about it and resembles a carbuncle.

It is possible that in this case the septic condition may have given rise to an erythema multiforme some of the lesions of which had become infected with anthrax.

It seems hardly possible that a man could live with 20 or 30 of these malignant pustules on the body much less walk into hospital and not feel ill in the slightest degree.

F. G. Finley, M.D. What struck me about this case was its extremely benign character. The diagnosis depended exclusively upon the bacteriological examination, as none of the lesions corresponded with the clinical features of malignant pustule.

J. Alex. Hutchison, M.D. I had the privilege of seeing this case and I feel very much like Dr. Finley felt in my surprise at the mildness of the type. The experience of many of us is probably limited to the one case of Dr. von Eberts a few years ago; it was of the single type and not such a diffuse nodular one as the present. Text-books refer to the two types and that the solitary pustule is much more serious and gives much more pronounced constitutional disturbances. This case certainly had some œdema when I saw it at a later stage of the disease, but only what one might expect if one were dealing with a local infection associated with some lymphangitis. I was also rather surprised to hear of the favourable termination. I rather expected that convalescence at least would be much more prolonged. I would like to ask if the sore on the animal's back was followed up and any effort made to take bacteriological cultures from it.

G. T. Stephens: The address given by the patient was visited but we were told that the horse was not there.

The ninth regular meeting of the Society was held Friday evening, February 5th, 1909; Dr. J. Alex. Hutchison, President, in the chair.

PATHOLOGICAL SPECIMENS.

A. Lapthorn Smith, M.D., showed the following pathological specimens: 1. Fibroid tumour from the left broad ligament; 2. Multiple fibroid tumour; 3. Large fibroid tumour removed for hæmorrhage; 4. Multilocular ovarian cyst in a young girl.

APPARATUS FOR THE CURE OF PAIN IN FIRST METATARSO-PHALANGEAL JOINT.

J. Appleton Nutter, M.D. A description of this apparatus will be found on page 162 of the Journal.

NEURITIS.

Norman Viner, M.D., read the paper of the evening.

A. T. Mussen, M.D. I would like to congratulate Dr. Viner on the able way in which he has dealt with this subject. Having treated many of these cases he was in a position to observe the course of the events which he has so clearly described.

In regard to neuritis there is still a great deal that is yet uncertain.

The work of Drs. Head, Rivers and Sherren on traumatic neuritis has explained much that was obscure, and I feel that if their suggestions are followed and a careful and systematic examination of other forms of neuritis carried out, we will be able to eventually account for some of the peculiar conditions found in this disease.

A. G. Morphy, M.D. One point about the diagnosis is, I think, that it is possible sometimes to get confused between anterior poliomyelitis and multiple neuritis. I remember having the case of a child who suddenly fell ill with intense pain in the four extremities, in fact hypodermic injections of morphia had to be given to allay the pain. It was only a few days later when the trouble began to localize itself in certain groups of muscles in the lower extremities that the diagnosis of anterior poliomyelitis was possible.

N. Viner, M.D. The onset with fever and the suddenness are much more suggestive of acute anterior poliomyelitis than of multiple neuritis. However, cases like Dr. Morphy's do occasionally occur, but a few days of observation rarely fail to clear up the diagnosis, as the case seldom fails to settle down to its permanent characteristics in a very short time.

PERFORATIVE APPENDICITIS, VENOUS THROMBOSIS, PARATYPHOID, INTESTINAL OBSTRUCTION.

Oskar Klotz, M.D. There are several points in this case of Dr. Bell's which are interesting from a pathological point of view. You will firstly

note that the vena cava in the specimen presented, lies on the left side of the aorta, as far as the right renal vein. The vena cava along with its two main branches, the common iliac veins, are thrombosed throughout, and the thrombi pass into the external and internal iliac veins on both sides. From the appearance of the thrombus, particularly to be noted in the firm grey character, one is led to believe that the iliac veins on the left side were first involved. On the right side the iliac veins contained a more recent adherent clot, which, no doubt, extended downwards from the thrombus as it was advancing from the left iliac vein into the inferior vena cava. It is remarkable that, although both iliac veins were completely plugged there was no evidence of œdema of the lower extremities when the case was seen at autopsy.

As to the paratyphoid infection, the paratyphoid bacillus was isolated from blood cultures some days after the appendix operation. What association this infection had with the appendicitis is not easy to say, and the question arises whether the appendicitis was the original and only lesion at the time of operation, or whether the paratyphoid infection was then present and had its main and most severe site in the appendix. I am rather inclined to take the latter view, and think that the severe symptoms of the appendicitis over-shadowed the manifestations of a general paratyphoid infection. The apparent normal condition of the patient without the signs of paratyphoid fever after the operation is probably to be accounted for by the general effect of the operative procedure on the body during a mild grade of infection.

The paratyphoid organisms were again isolated from cultures of the blood and spleen at autopsy.

F. J. Shepherd, M.D. Dr. Klotz's remarks are very fitting. I have seen several cases operated on for appendicitis which contracted typhoid fever in the hospital, but never attributed it to the appendix condition. I was interested in the fact that there was no œdema. Another fact was that the thrombosis commenced in the left iliac vein, why this should be so I do not know. Nearly always when you get a thrombosis after operation you get it on the left side. I think it is probably due to the enemata given in these cases. I am interested in the fact that the patient had a double inferior cava, due, no doubt, to the persistence of the left cardinal vein.

DIPHTHERITIC PARALYSIS.

A. H. Gordon, M.D. A report of this case will be found on page 237 of this number of the Journal.

A. T. Mussen, M.D. In looking up an old number of *Brain* of some

20 years ago, I came across a review of 1071 cases of diphtheria, 175 of which developed paralysis. It would be interesting to compare the course and results of the paralysis following diphtheria previous to the use of antitoxines with that which results at the present time. Of the 1071 cases 362 died from the effect of diphtheria before any paralysis had time to develop. 175 cases of paralysis developed from the surviving 709, and of these 17 ended fatally. In over 50 per cent. the paralysis was of the limited form, *i.e.* palate, ciliary muscle and ocular muscle. The onset was most marked on the 3rd, 4th and 5th week. The duration varied from 1—15 weeks, but the majority of the cases lasted from 6 to 7 weeks. Regarding deaths from the paralysis the greatest danger was during the 1st week, then lessening to the 5th week; there were none after this. In no case was the paralysis permanent. This report was of further interest as it showed the connection between the amount of exudation on the fauces and the subsequent paralysis. Three cases of paralysis showed no exudate, in 24 it was slight, in 45 moderate, and in 53 there was much exudate. Gowers states that adults furnish the greater proportion of paralysis in diphtheria; cases are few in infancy, but increase with the age of the patient. Also that paralysis is equally likely to follow mild attacks as those which are severe.

Dr. Gordon's cases appear to show very similar results, only the paralysis was later in developing. I would like to ask, what is the percentage of cases of diphtheria that develop paralysis now that antitoxine treatment is employed?

F. J. Shepherd, M.D. I would like to know the percentage of the laryngeal form in this condition.

J. Alex. Hutchison, M.D. Some years ago I was called to a house to see a child who had developed inability to walk and I discovered four cases of diphtheritic paralysis in the family. They had had a little sore throat some three or four weeks previously. These cases got well. Two were of the laryngeal type, one involving the muscles. Within the past two or three months an old patient of mine, living in the country came to my office with a child complaining that he had something the matter with his throat; I referred her to Dr. Hamilton White, who found a typical pharyngeal paralysis of the throat. The child complained of sore throat some two or three weeks previously.

A. H. Gordon, M.D. In reply to Dr. Mussen's question, I think that the percentage of deaths from diphtheritic paralysis as reported by Rolleston, would be from 15 to 17 per cent.; this includes cardiac paralysis. His statistics show a total of 1500 cases, 116 dying from all

causes and 58 from some form of paralysis. There were 335 cases of paralysis altogether. From all I can read, and from my own limited experience in the Alexandra Hospital, I think that paralysis very rarely follows purely laryngeal diphtheria; I have never yet seen a case. Dr. Hutchison's cases were interesting and would suggest a certain amount of susceptibility to the toxine in the family.

The tenth regular meeting of the Society was held Friday evening, February 19th, 1909, Dr. J. Alex. Hutchison, President, in the chair.

The meeting was addressed by Dr. Henry Christian, Dean of the Faculty of Medicine of Harvard University, Boston. Dr. Christian took as his subject: "Modern methods of investigation in Medicine as illustrated by recent work on nephritis."

The eleventh regular meeting of the Society was held Friday evening, March 5th, 1909, Dr. W. Grant Stewart, Vice-President, in the Chair.

PATHOLOGICAL SPECIMENS:—1. INFECTIVE THROMBOSIS; 2. MUCOUS COLITIS.

Oskar Klotz, M.D. The first specimen I wish to show you is one obtained from a woman, thirty-two years of age, who had been confined at full term on the 30th of January, without medical attendance. The patient had some temperature several days after confinement, and on February 6th had a severe chill with a temperature of 106°. On February 7th she was brought to the Hospital in a very low state, and blood cultures which were obtained gave streptococci. She died on February 17th.

At autopsy the uterus was fairly well contracted, but the cavity was lined by a necrotic slough, although there was no free pus within it. The placental site was on the posterior wall to the right side. The veins passing from the placental site were thrombosed, and they could be traced into the broad ligaments. Here and there the thrombi in the vessels had broken down into a purulent fluid. On the right side the thromboses passed from the veins in the right broad ligament into the ovarian vein on this side. The right ovarian vein was occluded from the broad ligament to its termination in the inferior vena cava. Save for a small thrombus at the mouth of the ovarian vein and projecting into the inferior vena cava this latter vessel was free, while the ovarian vein on the left side was also free from thrombosis. Curiously enough, there was also a thrombus in the left renal vein close to its exit from the kidney. The appearance of this plug in the left renal vein, with its rounded edges,

is not unlike an embolus, and it is possible that this plug is of the nature of a retrograde embolus.

The specimen illustrates very well the process of infective thrombosis beginning in the uterine sinuses and extending into the emissary veins. From the specimen it is evident also how the general blood stream is constantly supplied with fresh infection.

The second specimens are of a bacteriological nature. The bacteria were isolated from a case which has given us much trouble. The patient was a girl of twenty-six, suffering from a mucous colitis. The colitis had existed five months previous to her admission to the Hospital, and blood and mucous were present in the stools. Shortly after admission, cultures were made from the mucous discharge from a colostomy. This culture I show you here in comparison to a culture of B. typhi and B. dysentery, (Flexner). Culturally the organism resembles the Flexner bacillus very closely, save that it is motile and produces a greater amount of alkali in the litmus milk.

We have now had this culture under observation for over a year, but its reactions on the media are the same as when it was isolated. Briefly, its cultural features are the following:—

The organism is a Gram negative bacillus, about the size of B. coli. It is motile; does not produce spores and grows readily on ordinary media. On broth it produces a diffuse cloudiness, without a pellicle. On agar the colony is greyish-white, slightly moist and has a luxuriant growth. On milk there is a transient acidity of very short duration, followed by alkali production. There is no coagulation or digestion of the milk. Dextrose is fermented to acid without gas, as is also mannite. Lactose, saccharose and maltose are not fermented. There is no indol production. The organism was not agglutinated by known Flexner and Shiga dysentery sera.

This organism was isolated several times from the mucous discharge, and once in almost pure culture.

Twenty-one months after the beginning of the illness the patient died. The lesions in the large bowel were those of a chronic dysentery, which, in places, were in the process of healing.

Microscopical sections of the colon showed a loss of the mucosa in many parts of the bowel, with a thick granulation tissue in the submucosa. In other places there was some regeneration of the mucosal layer. We have, therefore, a typical case of dysentery, from which a dysentery-like organism was isolated. I believe that, although this organism is not a typical dysentery bacillus, it produced lesions which are identical with those of true dysentery.

TUBERCULOSIS OF THE LIP.

GEO. E. ARMSTRONG, M.D.

THE AFFERENT NERVOUS SYSTEM, PERIPHERY TO CORTEX.

A. T. MUSSEN, M.D., read the paper of the evening.

D. A. SHIRRES, M.D. I think we have to thank Dr. Mussen for bringing this valuable contribution to the meeting to-night. When Dr. Mussen was over in England he was very enthusiastic about this branch of neurology, and in continuing the study in the Montreal General Hospital has been able to bring out many factors which certainly I did not know, and we are hoping that as time goes on the interesting facts which Head has set forth will be confirmed. The paper is a long one and shows how hard Dr. Mussen has worked to get a line of thought from all these different facts.

EIGHT CASES OF TIC DOULOUREUX: DEEP INJECTION OF ALCOHOL FOR TREATMENT OF.

D. A. SHIRRES, M.D. These cases were treated with a mixture of alcohol, cocaine and chloroform; three were operated on by Dr. Armstrong. The injections were first tried on the cadaver and it was found an easy matter to reach the foramen ovale or the foramen rotundem. There is a certain amount of danger in connection with this operation; two of Patrick's 16 cases had serious results, and in one of ours, a tabetic with the tic douloureux for five years, after three or four injections one optic nerve became destroyed and there was paralysis of the third, seventh and eighth nerve. This patient, however, has since recovered, barring the loss of vision. Lœffler's blue was used on the cadaver to discover how this accident occurred. By a considerable amount of pressure and injecting the fluid rather rapidly it was found that the fluid could be infused up the foramen ovale, round the pituitary body to the medulla and lateral sinus. In another experiment it was inserted slowly and with less force and did not become so widespread. It was thus concluded that more time must be taken in injecting the fluid.

In all the eight cases cures have resulted; and although it is stated that the tic douloureux returns in a year to a year and a half, another injection will cure them again. This treatment has only been in vogue for some two to three years and a half, but I think it is an operation which carefully carried out will bring results. Certainly it is to be preferred to the removal of the ganglion, which should be undertaken only as a last resource.

GEO. E. ARMSTRONG, M.D. I cannot explain the accident which occurred in the case cited by Dr. Shirres. The trouble seemed to follow

the third injection and I am quite at a loss to account for it. My rule in giving these injections is to take ten minutes to inject the solution after the needle is in position and the syringe attached to the needle. I take the clock and just gradually send the piston down, taking up the ten minutes to introduce two centigrammes. Two other cases have been moderately satisfactory and another very satisfactory. This last was a patient between 60 and 70 years of age who had this trouble in a very severe form for over nine years. She has been completely relieved and is in fact a new person. My experience has been limited to some five cases and I feel that it is a remedy that ought to be tried. The operation of removing the ganglion has a considerable mortality even under Sir Victor Horsley and Harvey Cushing, and even if the patients recover there is a very great disability. Some of them have told me that if they had their ganglion back they would cheerfully bear the pain. I think, however, they could not stand the test; at the same time these disabilities are material. If we can go on with these injections without such accidents occurring as has been narrated, it seems to me that the method should be tried even if the relief is only for a year or eighteen months. Of course some time must elapse before the operation must finally take its proper place, but from what I have seen of it up to the present I am very favourably impressed with it; it certainly gives great relief and gives it quickly. I would like to ask Dr. Shirres if he can enlighten us as to the mode of action of the alcohol in these particular cases.

G. D. Robins, M.D. Dr. Shirres and Dr. Armstrong are to be congratulated upon the results of their cases. These results appear to be decidedly better than those obtained by excision of the Gasserian ganglion, and the considerable disability that follows it, if one takes into account the high mortality that accompanies this more radical operation. If further results from the injection of alcohol are equally encouraging, this indeed will be a great boon. I was very much interested in hearing Dr. Shirres's account of the unfavourable case, and I would like to ask him whether there were any changes in the fundus of the eye in which vision was destroyed; also whether the loss of vision came on suddenly or if it was of gradual onset.

A. Lapthorn Smith, M.D. I should like to ask Dr. Shirres if most of his patients were very anæmic and if the alcohol might not produce a temporary and then a permanent congestion of the nerve affected. As tic douloureux is a form of neuralgia and as neuralgia is the cry of the blood for better nourishment, it would seem that the most reasonable treatment should be the maximum of sunlight, fresh air, plain food and sleep, with all the iron that could be assimilated.

D. A. Shirres, M.D. We do not know the physiology of the action of the alcohol on the nerve, this has yet to be studied, but strange to say after the injection within an hour the pain is completely gone and yet there is no change in the sensation, they appreciate heat, cold and touch, just as well as on the other side and yet the pain is gone. Long before this, some ten or twelve years ago, different men used osmic acid and other things for destroying the nerve, but here we have simply the loss of the pain sense. As regards the tabetic case, whether the destruction of the optic nerve came on suddenly or not I could not say, as a very large ulcer formed on the eye within 24 hours, and therefore the ophthalmoscope could not be used. After my experiment on the cadaver I could easily see how an accident could occur by using rapidity and force in the injection. I cannot recall any of our patients being anæmic and I cannot see how that could be a cause. Why the right nerve should be so much more often affected in these cases than the left I cannot understand.

RUPTURE OF THE UTERUS.

H. M. Little, M. D.

Dr. Little described a rupture of the uterus occurring during a prolonged labor. After admission to the hospital, the case was operated upon.

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MULTIPLE NEURITIS.

BY

NORMAN VINER, B.A., M.D.

This paper is based entirely on a series of 52 cases in the indoor and outdoor departments of the Montreal General Hospital during the past twelve years.

Definition.—Multiple Neuritis may be defined as a general inflammation of the spinal nerves, affecting particularly those going to the limbs, and occasionally those going to the head and trunk. It is associated with muscular paresis or paralysis, sensory disturbances, subjective and objective, trophic changes, and diminution of reflexes.

Pathology.—The pathological findings indicate a more or less diffuse congestion or inflammation, which may be parenchymatous, interstitial, or more usually parenchymatous and interstitial, not only of the axone but of the nutritive centre as well, although the latter is hard to demonstrate. In other words there is inflammation of the lower sensory and motor neurones.

Etiology.—Relatively three times as frequent in men as in women, it is distinctly a disease of adult life, midway between adolescence and old age, the onset with men being usually ten years later than women. Alcohol is perhaps the most frequent individual cause accounting for 40 per cent., one-third of whom are women. Next in frequency lead poisoning with 13 per cent., followed by diphtheria with 11.5 per cent. Typhoid and influenza each accounted for two cases, diabetes for one. There was one due to some toxic material taken in a glass of whiskey, which had made several other partakers vomit immediately afterwards. Some of the remainder might possibly be accounted for by great exposure, very hard work, and a few more possibly to alcohol also. Occupation except in those working in lead may have been a factor only in so far that the great majority of the male victims followed laborious trades. In previous illness, rheumatism was the most common element, being

Read before the Montreal Medico-Chirurgical Society, February 5th, 1909.

present in one-third of the cases, the next frequent, perhaps, being sciatica. Syphilis was noticeable by its relative absence, having been present only three or four times. There were numerous associated diseases their coincidence apparently only being casual, with the possible exception of Cardio-Vascular disease, which was rather frequently present in the alcoholic cases. Recurrences were infrequent, there being one patient with two attacks, one with three, and one who for eight years in succession had an attack every spring. The general condition of the patient was usually good, sometimes very good, and but seldom very poor.

Symptoms.—The symptoms, limited in extent though varied in detail, consist mainly of sensory, motor, electrical, trophic, and reflex disturbances. The onset may be sudden or gradual; when sudden it is more commonly with weakness, when gradual with pain, sometimes with both combined. Many complain for weeks or months of numbness or tingling, before they perceive any weakness. Often the onset is with sharp lancinating pains, or there may be itching, burning, or sensations of heat and cold in the limbs. Rarely the patient is suddenly paralysed, as if struck down; more usually there is a feeling of weakness which steadily increases to its maximum.

To obtain a more adequate mental picture of the usual course of the average case of Multiple Neuritis we might adopt a more graphic illustration along the following lines. Suppose we imagine the victim of the malady on "all fours," resting on his fingertips and heels, and the toxine creeping on him from the floor in an icy flood. Soon the cold will be felt in the feet and particularly in the toes, then the fingers and hands will resent it, and, as is often the case with cold, a burning sensation will follow. These sensations will tend to send lancinating advance guards higher up the limbs. By now through weakness the toes are drooping and bunched together, and perhaps the stream has already swept away the Plantar Reflex. The foot now descends until the sole is flat on the floor, and we have "foot-drop," while the muscles there, now weakened to voluntary effort, return an unwilling contraction to the electrical stimulus—there is diminished faradic reaction. And, as we watch and observe the outstretched fingers gradually fold into the palm, the Achilles reflex is carried off, and the cramped calves begin to lose their firm outline and become flaccid, only less flaccid than the more rapidly yielding Anterior Tibial and Peroneal groups of muscles. By now the weakening wrists will flex under the pressure from above and we will have "drop-wrist." The burning pain is now inclined to give way to tingling and feelings of "pins and needles," which may ascend high to knee and elbow, or even to hip and shoulder. The knee-jerk has disappeared and perhaps the Radial and Ulnar reflexes; the muscles lower down now lie

flabby, soft, diminished, and respond no longer to the will or even the faradic battery. Their response even to Galvanism is now lessened, though rarely lost. The Biceps and Triceps reflexes are tottering and the upper muscles of leg and thigh, of forearm and arm, now yield a reluctant response to the faradic cell. As the patient himself becomes sensible of the ascending feebleness, his knees yield under him, and then his elbows. But not only does he sag as a whole—he must needs sag more to the right for he is more vulnerable on that side. The cold, the burning, the tingling, the pins and needles, have now given way in parts to an unappreciated feeling of numbness, which renders the patient insensitive in those areas to touch, to heat and cold, and sometimes even to the prick of a pin. The distal parts of the extremities are cold and blue, the skin is usually dry, sometimes perspiring, rarely œdematous, and frequently thin and shiny, with an absence of hair and occasionally of subcutaneous fat. By now the patient is usually fated to a surcease of suffering, but should greater misfortune be his lot, he sinks on his haunches, and, if his shoulders give way too, he falls to the floor an inert mass. If his trunk has also been involved, when we place him in a sitting position he is unable to maintain that position, or to bend or turn, but must of necessity sink down again, still maintaining an effort to keep his head more or less erect. When that, too, is attacked, excluding the diphtheritic cases, it is an indication of involvement of the cranial nerves, and with the ptosis and strabismus, the lingual, palatal, laryngeal, and, rarely, facial palsies, there is too often a paralysis of the pneumogastric and phrenic nerves, which can only result in death, an event, in this series at any rate, fortunately, of very rare occurrence.

Just as the development of the disease from onset to acme may be of long or short duration, so may the period from acme to culmination or cure, but although we sometimes have a sudden onset, we practically never have a sudden recovery. The dawning convalescence is manifested by a diminution of sensory symptoms, by increase in power, and by the return of the electrical phenomena and reflexes in the order given, which, it will be seen in regard to symptoms as also in regard to parts affected, is in the inverse order of the attack.

A good simile descriptive of the general tendency of Multiple Neuritis has been adopted by Dr. Shirres. It is of a plant or tree whose defective nutrition at the root is first manifested by deterioration at the most distant branches, so here, without carrying the simile too far, it is to be noticed that the earliest and most marked signs of the disease are in the most peripheral parts. The sensory changes, the paresis or paralysis, the trophic and electrical changes, are more marked in the feet than the legs, in the legs than in the thighs, and similarly with the upper extrem-

ities. Again, the lower extremities are more vulnerable than the upper ones, the extensors than the flexors, and—a remarkable fact brought out by the present series—the right limbs are usually more early, more frequently, or especially more severely attacked.

Special Forms.—Of the special forms of Multiple Neuritis, only the diphtheritic, the lead, and the alcoholic varieties of this series merit any special attention. The alcoholic cases showed in addition to the features frequently associated with chronic alcoholism, such as tremors of the hands and tongue, Cardio-Vascular changes, nervousness, a rather marked preponderance of sensory symptoms, especially pain. The pain in many cases was severe and constant, often preventing sleep, and lasting for many weeks, and even months. Although in a few cases the motor power was rather good, the vast majority were greatly incapacitated. The involvement, as a rule, was of all the extremities, although there were a few in which the uppers or lowers alone suffered, with a similar number who had the trunk attacked as well as the limbs. In the present series it was questionable whether the uppers could be considered weaker than the lowers, as is said to be usually the case.

The diphtheritic cases showed few sensory symptoms, with an almost total absence of pain. The weakness was more marked in the lowers than the uppers. In addition, there was almost in every case disturbance of accommodation, deglutition, and speech, being due to paralysis of the ocular muscles extrinsic and intrinsic, of the tongue, palate, and larynx. In consequence of these conditions there were strabismus, ptosis, defects of speech, difficulty or pain in swallowing, regurgitation of fluids through the nose, and disturbance of vision, in different cases. The duration of this series was less than the average, and, strange to say, the majority of the victims were adults.

Lead Neuritis.—Of the seven who suffered from this condition, three were painters, one an artist who mixed his own paints, one a carter for the White Lead Co., and the remaining two women, who, together with a friend of theirs, had used the same lead face lotion and had all suffered similarly as a result. In this series the duration was longest, most of the patients having the disease for over two years, and one for no less than twenty-nine years. There was a somewhat greater tendency to involvement of the uppers than the lowers, so that wrist-drop was generally more frequent and marked than foot-drop. The sensory symptoms were more marked than in the diphtheritic, but less marked than in the alcoholic form, pain being the most frequent sensory symptom. Cramps, especially in the legs, were rather common. In the majority of the cases the supinators escaped. Two of the cases showed some mental symptoms, one being drowsy and dull for a while, the other extremely nervous.

There was almost as much tendency to increased as to diminished reflexes, especially in the old-standing cases.

Special Symptoms.—Mental change in this series was extremely rare, and, such as there was, was much more suggestive of an associated condition, due to the primary toxic agent than of an integral part of the neuritis. Insomnia was frequent and due to the pain. Fever was present at the onset in a few cases and persisted for some time in some of them. There was only one doubtful case of sphincteric involvement. Diarrhœa occurred in many of the cases with an acute onset. Constipation was present in almost every case, and was probably due to the change from an active to an inactive life. Headache occurred mainly in the cases suffering most from constipation, and was more likely due to that condition, than to a neuritis of the nerves of the head.

Sensory Symptoms.—Subjectively there were itching, burning, heat and cold, tingling, pins and needles, lancinating pains, and numbness; objectively there were tenderness, delayed sensation, referred sensation, and anæsthesia. All these sensations were more marked in the distal parts of the limbs. The extent and variety of the sensory changes varied with the patient, the stage of the illness, and the part of the body affected. Subjective disturbances were almost invariably present, as also was tenderness, which was usually most marked in the calves and in the forearms. Anæsthetic areas were by no means invariably present. Tactile sensation was most vulnerable, followed in frequency by confusion to heat and cold, and comparatively infrequently was a pin-prick not felt. Delayed and referred sensations were rare.

Motor Symptoms.—The motor symptoms vary from the slightest grade of weakness to the most complete paralysis whether of a single muscle, a group, a whole limb, or all the extremities, and sometimes even the trunk may be involved, as well as some of the muscles of the head and neck. Again, all grades of paresis and paralysis may coexist in the muscles of the same or different limbs, and, as already mentioned, the tendency, in the great majority of cases, is for the more distal muscles of a limb to be more severely affected than the proximal ones. Twitching and spasmodic movements occasionally, and tremor frequently, occur. Wrist-drop and especially foot-drop are among the commonest manifestations of extensor susceptibility, although flexor deficiency, most obviously indicated by weakened hand-grasp, is not far behind. Flexor weakness, however, is often overestimated, owing to its exaggeration by the lack of balance, or disturbance of synergic action, produced by the greater extensor trouble.

Inco-ordination is mentioned in perhaps one-half of the cases and may be present in the hands and feet. It is due primarily to anæsthesia in

the fingers and soles, and this combined with the muscular weakness, and possibly some loss of joint-sensation, renders some of the finer movements such as buttoning clothes, writing, and even walking, very difficult operations.

The gait may be stamping, with a broad base, and more or less ataxic, as in Tabes. In perhaps one-third of the cases there is a distinct steppage gait, and more frequently simply halting, unsteady, or dragging gait, due purely to the weakness. Most of the patients, at one time or another, may be unable to walk at all, on account of the degree of paresis.

Loss of sense of position of the joints is uncommon, and loss of stereognostic sense is not mentioned as often as might be expected.

Trophic Changes.—Obvious atrophy occurs in only about 25 per cent. of the cases, and, as with sensory, motor, reflex, and electrical changes, is more apt to occur in the distal than the proximal parts affected. The atrophy is but seldom extreme and rarely as marked as in the local neurites, as, for example, in some of those caused by trauma. The parts involved in Multiple Neuritis may show localised areas of coldness, rarely of heat, infrequently of perspiration, and occasionally of glazing of the skin. The nails at times also show nutritive defects. Cyanosis and œdema of parts are also much rarer than in the traumatic forms. The muscles even of a well-nourished patient are generally soft and flabby, and those most affected may show an extreme degree of flaccidity or loss of tone.

Contracture as a result of Multiple Neuritis was uncommon in this series.

Electrical Reactions.—These vary from diminution of faradic reaction to complete reaction of degeneration, the former being almost inevitable, the latter rather exceptional. In different muscles and muscle groups supplied by the same nerve may be found all stages of faradic decrease, frequently of galvanic decrease, and more rarely do we find that the anodal closing contraction is greater than the cathodal. In addition electrical sense, i.e., susceptibility to pain from a strong electrical current is generally diminished. Very rarely do we find increase of electrical reaction or electrical sense.

Reflexes.—The reflexes in the areas affected are generally lessened or lost, particularly in the lower extremities. The Achilles reflex and the knee-jerk are usually the first to go and the last to return. Increased reflexes, one or more in number, associated, or not, with abnormal reflexes such as Rectus and Achilles Clonus, Oppenheim and Babinski signs occur in about 10 per cent. of cases. These usually have been found not at the commencement of the disease, as might be expected.

but more usually at later stages. They may, however, have been due to associated conditions.

Diagnosis.—The diagnosis in a well-marked case is very readily made from the sensory, motor, trophic, electrical, and reflex changes, and the majority of cases do show all these changes. However, cases appear in which the sensory symptoms are uncertain or absent, where the motor weakness is not marked, where there is practically no atrophy or other alteration of nutrition. But cases in which all of these are absent are extremely rare, and almost invariably some diminution of faradic reaction, and of some important reflex in the area invoked, will establish the diagnosis. What is more important, because more commonly a source of error, is the establishment of the exact amount of territory involved, to avoid the assumption of a localised neuritis for a multiple one. It must be remembered that a patient complaining of pain or weakness in a single limb may have all involved, though to so slight an extent as not to be evident to a superficial examination. It is therefore necessary to go over every limb, in fact every muscle of every limb, very thoroughly; to compare limb with limb, and, in cases of slight or apparently no involvement, to compare with a normal individual, say the examiner himself, especially as regards the electrical examination. Again, different groups of muscles balance each other, so that when one group is weakened, the other through this loss of balance is also weakened. The consideration here then is to estimate how much of, say, the flexor weakness is intrinsic, and how much due to the paralysis of the extensors. A few practical hints of value in order to avoid pitfalls in the particular, rather than the general, diagnosis might now be referred to. Diminished motility and reflexes are due to stiff joints occasionally, caused by the involvement of articular nerve branches, sometimes to the knee, more often to the shoulder. Faradic examination of the extensors will often give an apparent contraction, which, on careful scrutiny, will be found to have been not of the extensors, but of the underlying flexors. This is a particularly common source of error in the forearm, and less so in the leg. Often a muscle that will not contract to faradism, when the electrodes are wide apart, can be made to do so by their approximation. A faradic reaction nearly gone, or barely returned, can often be elicited much earlier than by the ordinary method, by one or two closures with the finger, of the slow vibrator of the faradic battery.

The confusing factors of spasmodic movements, increase or reappearance of pain, or hyperæsthesia, increased reflexes, and rarely increased faradic reaction or electrical sense, all the results of irritative action on the involved nerve rarely all occur in the same patient or at the same

time, and there is practically never any difficulty in arriving at a correct diagnosis, due to the preponderance of symptoms clearly pointing to a depressed condition. The arrangement and nerve supply of the muscles or muscle groups attacked will often serve to identify the general disease, or the etiological factor, thus groups of weakened muscles supplied by an individual nerve suggest neuritis, groups supplied by a special spinal segment suggest anterior poliomyelitis; escape of the supinators usually points to lead as the cause of the neuritis.

About the only diseases which call for differentiation are anterior poliomyelitis and tabes. The former is excluded from multiple neuritis by its abrupt onset, and by its asymmetrical distribution, and from localised neuritis as well, by its segmental distribution and the absence of sensory symptoms. Tabes is excluded by its lack of muscular weakness, and electrical changes, by its different trophic changes, and by the presence of the Argyll-Robertson pupil and of changes in the organic reflexes.

Course and Duration.—This condition which seldom attacks two limbs without involving all, seems at times, through the mildness of the infliction, to have allowed the uppers or lowers, more commonly the former, to escape. Such, however, is not the case, and at some stage of the ailment examination will show that all are involved, though may be in very different degree. The duration varies from months to years, although the average attack may be said to last from onset to conclusion about six months. As a general rule the tendency of the disease is to gradually rise to its acme, and, if the cause has been removed, to more gradually descend to normal. Complications and death due to this disease are very rare, the few cases so resulting in the present series, 4 per cent., being caused primarily by the involvement of the phrenic nerve. The general tendency, however, is not only recovery, but complete recovery.

Prognosis.—The prognosis in any particular case depends on the cause, its removability, the extent of nerve degeneration it has led to, and the locale of the involvement, i.e. have vital nerves been atttacked or not, as for example the phrenic or pneumogastric. It might be apropos in connection with the prognosis to advert to the general value of the faradic battery. This cheap single-celled instrument is an invaluable aid, not only to the treatment, but to the diagnosis and prognosis as well. With its aid we can not only exclude a malingerer who simulates pain and weakness, but establish as genuine the malady of an individual who, on account of the absence or doubtfulness of other symptoms, appears to be malingering. For the diminished or lost reaction of the muscles in question to a normal faradic current will often tend immediately to establish

the nature of the ailment, particularly so has it been found in a considerable proportion of the cases which have been sent to the hospital with the diagnosis of rheumatism. Its value in regard to the prognosis lies in the fact that a muscle, that will not contract to the strongest faradic current, will not get well within six months to two years. In regard to muscles which do react to faradism, the duration is measured in inverse proportion to the amount of reaction, thus, a muscle that reacts almost normally may take one month to get well, whereas one that shows only the least amount of reaction, perhaps to the strongest current, will probably take six months to recover. Diminution of electrical sense in this way is also an aid to prognosis, although not nearly as valuable as in the diagnosis.

Treatment.—The treatment for neuritis is first and foremost to remove the cause, if still operating, then for the multiple form rest in bed, especially for the worst stages. General tonic treatment for the local or multiple forms has now been commonly neglected, excepting for the small proportion of patients who happen to suffer from a run-down condition. The main lines of treatment are electricity, passive motion, and massage. Massage should be applied for a few minutes every day, and in hyperæsthetic cases, as in the alcoholic form, should be milder than in others, particularly in lead, where it may be given quite firmly. The passive movements are particularly valuable in stiffening joints and in muscles tending to contracture. In regard to electrical treatment, where there is no faradic contraction, galvanism should be given; where faradic contraction is present faradism or galvanism may be used. In either case an interrupting electrode should be employed; the current, which must be given daily for ten or fifteen minutes, should be just sufficient to elicit a contraction. It is advisable not to crowd the contractions, but to allow each one full scope, and to apply the anode to sensitive parts and the cathode where more stimulation or irritation is required. Sometimes, in order to contract, muscles require a current of rather painful degree. In these cases approximation of the electrodes will often overcome the difficulty. We might now give some consideration to the value of the electrical treatment. It has recently been demonstrated that the sponge of the anelectrode dipped into a medicinal solution and applied to the part will drive the drug into the system, when the constant current is turned on. Iodides, for example, will by this method, which is called Cataphoresis, appear in the urine in one hour. Galvanism therefore has an osmotic action, and on this basis will tend to deplete an œdematous or congested nerve, so that it therefore has a direct curative action. In addition both galvanism and faradism by keeping up muscle function,

maintain muscle nutrition, so that when the nerve is restored to normal, it has a fair amount of muscle to act on. The value of the electrical treatment is best realised in the long-drawn cases especially where there has been nerve degeneration. Here the continuous treatment of many cases has shown a slow and steady improvement from complete reaction of degeneration to faradic response, and finally to complete faradic reaction. But the remarkable and suggestive element in these cases has been, as is common in outdoor practice, that many of the patients would absent themselves for weeks and even months, and almost invariably there would be arrest of improvement or even retrogression, and after a return to the clinic of perhaps a month, improvement, even if only slight, would again be evident. Edema often present, especially in traumatic neuritis, through diminished conductivity, often hides an electrical reaction, which is really present, consequently giving a wrong impression as to the severity of the condition. As it is consequently difficult to give proper treatment, efforts should be made to reduce this condition, which is generally accomplished by the aid of gentle kneading, baths of bran or lukewarm water, and support or elevation of the limb. Cases frequently appear, where owing to an accumulation of dirt, or a condition of the skin approaching ichthyosis, conductivity is diminished, and electrical contractions can be elicited only with painfully strong currents, or not at all. In such cases a few good hot baths, local or general, will often show wonderful results. The sensory symptoms are very troublesome in many cases, and must be provided for. Minor ones such as itching, tingling, or even the sensation of numbness, may at times be readily overcome by a hot compress or bath, or a little gentle friction. But for pins and needles sensation, or severe pain, these measures are ineffective. The antipyretics and opiates, though very efficient, are inadvisable on account of the long duration of the malady. Hot lead and opium fomentations have given relief in many bad cases. Local applications such as blisters, the cautery, and other counter-irritants, are dangerous on account of the risk of producing indolent ulceration, especially in areas where the disturbance of nutrition is already considerable. Milder, soothing and analgesic applications, such as the liniments of aconite and belladonna, may be applied but with very little friction. In applying heat locally especially to an anæsthetic area, great care must be taken to see that there is no danger of burning or scalding. Finally, cases of contracture and permanent paralysis come within the sphere of the orthopedist rather than the neurologist. However, to avoid contracture, say of the flexors of the wrist and fingers, a splint is often very effective, if applied early enough.

VOLUMINOUS SARCOMA OF THE BULBO-PALPEBRAL CONJUNCTIVA.

BY

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The following observation seems to us to have a certain interest if we examine, either separately or collectively, the symptoms noticed in our little patient. Primary sarcoma of the bulbo-palpebral conjunctiva is indeed a comparatively rare affection in which the seriousness of the prognosis increases with the advance of the growth towards the orbit. Having for its origin the conjunctival chorion, or the adjacent connective tissue, the tumour in growing raises the oculo-palpebral mucous membrane which is stretched over it. In this case, the rapidity of the evolution of this unpigmented sarcoma, which in the short space of seven weeks developed in a child of six years of age, should especially attract our attention. Although neither the preauricular nor the cervical glands were enlarged, we nevertheless considered the condition as very serious, since the tumour had already begun to spread to the orbital vault and the capsule of Tenon, and as a previous microscopic examination of the growth had shown its sarcomatous nature. We did not hesitate, therefore, to sacrifice this still healthy eye in making the exenteration of the orbit.

Case report.—The child, T. R., aged six years, was brought to us at the Hôtel-Dieu on January 11th, 1908, suffering from a tumour of the right eye. According to his mother, the tumour showed itself a month previous, at which time she noticed that this eye was smaller than the other. The ptosis, having one day attracted her attention more particularly, she attempted to open the child's eye wider, and found that there was "a kind of reddish skin" between the eyeball and the upper eyelid. No other symptom had previously been noticed, and this tumour, which had a tendency toward hemorrhage, began from that time to secrete a sero-purulent liquid, which increased in proportion to the rapidity of its development.

Family history.—Our patient was one of nine children, one of whom had died at the age of three years of tubercular meningitis. The others were in good health. We found a certain tuberculous diathesis, but no trace of cancer.

Personal history.—The patient had a good constitution, was rather robust for his age, and had had no illness except a suppurating sebaceous cyst on the right side of the neck which had persisted intermittently for five years. However, the mother admitted that his respiration was not

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normal, that at night he slept with his mouth open, and that his breathing was noisy.

There was no record of traumatism, or of foreign bodies in the right eye, nor even of conjunctivitis.

Present condition.—On examination, we observed a tumour hanging on the cheek by means of a large pedicle inserted at the bottom of the superior cul-de-sac of the right eye. This neoplasm was of granular appearance, bled at the slightest touch, and was of an angry red colour. It was partly covered by the conjunctiva of the upper everted eyelid. A sero-purulent discharge escaped continually from this eye, causing a slight redness of the cheek. The tumour measured in its antero-posterior diameter about two centimeters; it was five centimeters in length and seven centimeters in width. On lifting it we observed that the cornea was normal, and that the pupil reacted well. The ocular tension was not increased; there was no exophthalmos, nor any depression of the eyeball. The movements of the eye were naturally limited, but the direct vision was as good in the right as in the left. There had been no pain since the beginning of the illness, and there was an absolutely normal condition of the left eye. Anterior rhinoscopy of the two sides showed nothing very interesting, but the posterior rhinoscopy allowed us to observe adenoid growths.

There was slight hypertrophy of the tonsils. The ears had never been diseased, and there was no hypertrophy of the cervical nor preauricular glands. No symptoms of hereditary syphilis or of tuberculosis were discovered.

A small piece of the neoplasm was removed for microscopic examination and entrusted to Dr. St. Jacques, who was good enough to send the following report: "The microscopic examination of the preparations "shows a mass of cells arranged without order. Here and there, debris "of the conjunctival fibres are observed. One of the preparations shows "a tendency towards alveolar arrangement. The cells are small and "round, the nuclei rather large, very variable in size, presenting numer-"ous karyokinetic figures. In the field there appeared a large number "of vascular formations, very characteristic of sarcoma, among others, "openings whose walls were formed by the cells of the growth itself. "The greater part contained no blood corpuscles.

"There was no epithelial covering visible on the surface of the tumour. "Near the periphery are found capillaries containing red corpuscles. "These capillaries are seen sometimes in transverse, sometimes in longi-"tudinal section. Some, however, contained comparatively large number "of white corpuscles, which is easily understood seeing that from the

January 12th, 1908.

January 26th, 1908.

"surface of this tumour exuded a rather abundant muco-pus. There is a "slight inflammatory infiltration.

"These preparations contained no pigment.

"Diagnosis: Round celled sarcoma of apparently rapid growth."

During the time following the first examination we witnessed the truly remarkable development of this tumour, as the two following photographs show: the first taken on the 12th of January, and the second on the 26th of the same month.

Treatment.—As the microscope had shown us the malignant nature of the tumour, we proposed to the family to make an immediate removal and the operation being decided upon, took place on the 28th of January.

First operation.—The patient having been anæsthetized with chloroform, and the field of operation rendered aseptic, we first made a large canthotomy. Having raised the growth, we were able to incise the ocular conjunctiva which was separated from the upper two thirds. We then observed that Tenon's capsule had been invaded, and raised from the underlying sclerotic now plainly visible. The pedicle was implanted the whole length of the superior cul-de-sac, and embedded in the orbit for a depth of one and one-half centimeter. The everted eyelid did not, however, adhere to the tumour, which was easily separated from the healthy tissue and removed. It was found to weigh fifty grams. This marked destruction of the capsule of Tenon and of the roof of the orbit, left us no doubt as to the gravity of the condition, and obliged us to continue the operation by proceeding to a complete exenteration of the orbit. We then sacrificed this eye, which was normal internally, as well as the retro-bulbar tissues. Great care was taken in the cleaning of the orbit. All doubtful tissue was then removed from the eyelids, and the operation completed by a careful cleansing of the wound, some sutures at the external canthus, and an appropriate dressing. We also took advantage of the anæsthesia to curette the suppurating sebaceous cyst to which we applied tincture of iodine.

The bacteriological examination of this pus revealed nothing particularly interesting except absence of tubercle bacilli and actinomyces. The post-operative care was most simple. The cavity washed daily with hydrogen peroxide suppurated very little, and became rapidly covered with a layer of healthy granulation tissue; everything that showed a tendency to hemorrhage was cauterized or removed by curetting. At the end of a month, the little patient was considered nearly cured, and we proposed to perform the following week a median tarsorrhaphy when serious complications occurred to prevent this. Scarlatina and varicella were brought to him simultaneously by his relations who came to visit

him at the Hôtel-Dieu, and we were obliged to send him to the St. Paul's Hospital for Contagious Diseases where he was admitted February 28th. March 5th being in full eruption with scarlatina, varicella was noticed and spread from him to all the other little patients in that ward. From this time, this combination of diseases caused a very serious illness and on March 13th, acute nephritis came on. Two days after endocarditis was diagnosed and on March 20th generalized œdema appeared.

To complete this series of striking symptoms, on March 26th there came on a general œdematous infection of the scalp. In spite of all these complications, his temperature never passed 103° F., and the improvement was such during the month of April that the little patient was allowed to return to the Hôtel-Dieu on the 29th entirely recovered from his eruptive fevers. We then continued to treat the orbital cavity, which had become infected during his stay at the St. Paul's Hospital, removing from it the granulation tissue which had accumulated in the lower part only. These granulations examined under the microscope revealed no trace of sarcoma, and reassured us as to the possibility of a relapse. At the end of a month's time, the wound in the orbit was healed, as was also that in the neck, which had been curetted and to which wet dressings had been applied.

The adenoids having been removed, only the æsthetic treatment of the orbital cavity remained. The upper eyelid being retracted, left the cavity slightly opened, which, aside from causing a disagreeable appearance exposed the patient to infection from the outside.

As the orbit was partly filled with a solid granular tissue, we decided to perform a median tarsorrhaphy which took place on June 4th.

Second operation.—Again under chloroform, we detached the eyelids circularly even to the bony margin. After having trimmed the median part of the meibomian lips for the length of a centimeter, we applied two sutures, preserving the normal position of the ciliary field. Hemostasis being complete, we finished this little intervention by applying a moderately compressive dressing. During the days following we used antiseptic washing, and on the 18th of June, the little patient returned home entirely cured.

We were pleased to observe that the palpebral opening was entirely closed, and in spite of the tarsorrhaphy the orbicular muscle had retained a certain power of action. The orbital depression is but slightly noticeable, and the eyelids are applied directly to the bottom of the cavity.

Is the cure permanent? If we consider on the one hand the rapid development of the sarcoma before removal, and on the other the fact that the cure has already lasted for ten months, we have cause to hope so.

CEREBRAL AND EPIDURAL ABSCESSES OF OTITIC ORIGIN.

BY

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Some degree of apology might consistently be offered for introducing so large a subject as Brain Abscess to be discussed in the short time allotted to the reading of a paper, when I consider the fact that we might profitably occupy an entire evening in the consideration of its diagnosis alone, if we took up the matter *in extenso*. It must be therefore in a very superficial way that I will refer to some of the salient features of this disease, which is or should be of intense interest to every practitioner of the healing art, whether he or she be general or special.

To begin with, it is rather humiliating to admit, as we must, that notwithstanding all previous endeavours, it often happens, brain abscess is first discovered at the autopsy. The causes of a mistaken or delayed diagnosis of a brain abscess of otitic origin are various. Every intracranial complication, which has its origin in a purulent otitis, may make its appearance in a sharply defined and easily diagnosed picture. For certainty of diagnosis, however, a fully developed symptom complex is necessary. Many signs pointing to brain abscess may belong to a complicating meningitis. When we remember how intimately in the course of their development, the complications are intertwined, and how the signs of ear disease, functional nerve disturbances and other brain lesions, can closely simulate this condition, we realize the difficulties of diagnosis. So great a master as Schwartze was uncertain of a diagnosis which seemed to lie between an abscess of the temporal region and a meningitis. The autopsy proved it to be a cerebellar abscess. The variations and latent course of brain disease may make the diagnosis very difficult, indeed sometimes impossible. A patient may have an acute or chronic inflammation of the ear with no evidence of brain implication, and be discharged as cured, having only a slight headache perhaps, and feeling well enough to resume his ordinary occupation. In such a case cerebral abscess may develop; indeed instances are on record where a couple of weeks after apparent convalescence the patient has suddenly died from brain abscess without previous signs of its existence. On the other hand this abscess may be latent for many years and long after its origin be excited to renewed activity.

A localized purulent focus within the brain tissue may be either acute or chronic. Acute cases are rare, while the most common cause of chronic cerebral abscess is purulent otitis. These abscesses may involve any region of the brain, may follow a simple inflammation within the tympanum

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with pus, by direct extension of the infection through the tegmen and dura, or may follow other avenues by veins and lymphatics; or pus in the mastoid may cause them; or indeed it is claimed and seems proved that a collection of pus in any part of the body may, through metastases, cause the formation of a cerebral abscess. The locality most frequently affected through purulent otitis is the temporo-sphenoidal lobe, and the next in frequency the cerebellum. If it be located so that the increase in size causes pressure on the motor tract, or upon the motor area of the cortex, then localizing symptoms ensue. When the abscess is chronic the increase in pressure develops so gradually that paralysis may occur without convulsions. In chronic cases a marked impairment of health may be the first sign of cerebral abscess. The temperature is seldom above 99 F. the pulse normal, subnormal or intermittent. Headache is apt to be present and is dull or diffuse in character. Sometimes sleeplessness is the only symptom for which the patient seeks advice. Again you may have anorexia, irritability, sleepiness and a stuporose state, gradually deepening into coma. It is well to remember that an otitis on one side may produce an abscess in the opposite hemisphere. Examination of the eyes is sometimes a useful aid, for optic neuritis is often present.

When there is pus between the dura mater and the osseous wall of the cranium it is only necessary to perforate the skull in order to evacuate the fluid. The decision as to the exact location of an epidural abscess is sometimes a difficult matter, but experience has shown that the most usual location (Dench) for such abscesses has been either in the posterior cranial fossa, or the middle fossa. In emptying these abscesses it is unwise to remove the bone beyond their limits, for there is danger of breaking down the firm adhesions which protect the cranial cavity from the purulent collection. If a perisinus abscess is opened it is most important to separate this cavity from the mastoid wound to prevent infection of the exposed dura, which might result in general purulent meningitis, and hence if the cavity be large the dressings may require changing daily or oftener. The results generally of operative treatment in simple epidural abscesses are very favorable.

Apropos of these remarks I beg to report to the Society a case wherein there occurred simultaneously one temporo-sphenoidal abscess, two epidural abscesses, and one sub-periosteal abscess in the same subject all of otitic origin, within a comparatively short time.

Mrs. M. entered the Western Hospital on 28th December last complaining of pain and swelling behind the right ear, with occasional headaches. She was 37 years old, the mother of eight children in 10 years of married life, and was again pregnant. She had "pleurisy" 2

years ago and poor health ever since. At the beginning of November last the patient had a severe earache lasting 6 to 8 hours. Then a watery discharge from the ear began and lasted for 3 weeks, after which it changed to pus and continued for a week or so longer when it ceased. After the pus stopped a swelling started behind the same ear accompanied by great pain. This condition lasted with more or less severity for about a month when she sought relief at the hospital. Her father and sister died of tuberculosis sometime ago, otherwise the family history was negative. The patient's condition on entering hospital was as follows:—Behind the right ear over the mastoid, a large area of swelling is seen. This area extends backwards from the auricle 2 inches and from a horizontal tangent corresponding with the tip of the auricle, it extends downwards to the mastoid tip. It is red œdematous and boggy and has thickened the tissues throughout the region indicated, but especially over a portion of it to thrice their normal state. This whole area is extremely sensitive on palpation and causes much suffering. There is a superficial sinus on the same side, an eighth of an inch in diameter undermining the cellular tissue, beginning at the digastric fossa and extending along the border of the sterno-mastoid muscle downwards five inches, which discharges some pus. In the external auditory canal the postero-superior wall is sagging, and largely obscuring the membrana tympani which is whitish, owing to epithelial necrosis and exfoliation. A perforation is seen in the posterior inferior quadrant. A little pus present. The patient's condition generally was most unsatisfactory, being emaciated and greatly reduced in health, first by too frequent childbearing and secondly by the almost constant suffering of the past 6 or 8 weeks. To make matters worse she was again pregnant.

Operation.—After the usual preparation the patient was anæsthetized, a free opening made in the drum membrane, and the ordinary curvilinear incision behind the auricle. At right angles to this another incision was necessary across the swollen tissues. Considerable pus was evacuated below the periosteum. After cleansing this region I opened the tympanic antrum. The tegmen antri showed a slight superficial change in its condition, and did not give the ordinary resistance of healthy tissue. No pus was found, however, on curetting it. In the aditus, attic and hypo-tympanum the probe and curette communicated good resistance. The mastoid cells were then opened, including the tip of the process, pus being found everywhere as far as the inner table of the skull. An area of necrotic bone was encountered in the mastoid, directly behind the external auditory canal, and in curetting this away it led to the lateral sinus, the dura of which had to be exposed before reaching healthy bone. At this point a peri-sinus abscess was tapped, which

contained about two teaspoonfuls of creamy pus. This was cleaned and drained, special packing being inserted to ward it from the generally infected mastoid cavity. From the antrum to the external auditory meatus the channel was found quite patent, and free for drainage. The wound was therefore closed in the usual way, after inserting proper drains into it and the superficial sinus. The hospital laboratory reported staphylococcus infection. From the date of this operation the patient's temperature, pulse and general condition were practically normal for over two weeks, the wounds were healing satisfactorily and for a time she gained in strength. Maximum temperature, 98 4-5 F., pulse 72 to 84. On the 14th January, however, a wave of temperature rose one and a half degrees, for 6 hours, then remained normal for 2 days further, when a low septic condition asserted itself, with headaches, some irritability and occasional emesis. A lumbar puncture showed the cerebro-spinal fluid clear, no turbidity or sediment, no meningococci or other bacteria, the specimen being practically normal. The hospital pathologist, Dr. Nicholls, reported that the blood corpuscles were normal in size, shape and number. The hemoglobin was 85 per cent. with, he thought, slight leucocytosis. Examination of the eyes did not give evidence of any pronounced meningeal trouble, neither was there any clinical evidence of sinus thrombosis. On 27th January, after consultation, a second operation was decided upon. On the morning of the 28th, just before this operation was begun, some new symptoms developed, and the hospital neurologist, Dr. Robins, reported as follows:—the patient is semi-stuporose for the first time, but can be roused to answer simple questions; there is external squint of right eye; the pupil in this eye is larger than the left, showing weakness of third nerve; at times a left sided Babinski, not constant; left hemiplegia noticeable; deep reflexes all active. Sensation normal as far as could be tested. Second operation,—Assisted by Drs. England and Kerry the former mastoid wound was re-opened. The granulations in the mastoid were found satisfactory, but this time the instrument passed through the tegmen antri into the floor of the middle cerebral fossa with hardly any resistance, and a quantity of thick pus was here released from an epidural abscess. A button of bone was then trephined through the squamous portion of the temporal, and the dura exposed. This was opened and a trocar and canula inserted into the temporo-sphenoidal lobe, directly inwards and downwards. On withdrawing the trocar a stream of very fluid pus followed, which measured about an ounce. On again examining the tympanic cavity, the channel to the external meatus was found patent; drainage was then inserted into both abscesses; the wounds cleaned and dressed. The patient rallied well and the result seemed promising for 48 hours. It was noted

that the left Babinski had disappeared, there were fewer headaches, patient readily replied to questions, and voluntary power was returning in the left arm and leg. However, on the third day a change occurred, collapse supervened and the patient succumbed. An autopsy was made on the brain only and was as follows:—A trephine opening was found in the squamous portion of the right temporal bone, and evidence of a former mastoid operation. On the floor of the right middle cerebral fossa an operative opening was found 1½ by 1 centimeter in size, leading to the tympanic antrum. The tympanic cavity proper and contents were free from necrosis. A large abscess cavity was found in the right temporo-sphenoidal lobe of the brain, extending from almost the apex of the lobe backward to a point approximately opposite to the upper end of the fissure of Rolando. The cavity, which was empty, measured antero-posteriorly 6.5 centimeters and transversely 6 c.m. The wall consisted of a zone of condensation, covered with detritus (an attempt at the formation of a pyogenic membrane) surrounded by a line of congestion. Towards the posterior part of the right island of Reil, above the posterior extremity of the cavity, was an area of incipient red softening, which involved to a slight extent the internal capsule on that side, just before it reaches the crus. Above the centre of this was a more definite area of red softening 7 millimeters in diameter. Anteriorly this area of red softening was continuous with the abscess cavity. The right internal capsule and the tissues between it and the abscess showed well marked yellow softening.

Conclusions.—Although no pus came from curetting the tegmen antri in the first operation, I think in the light of later events and in view of the known frequency of abscesses occurring in this region, from purulent otitis, I would in future be disinclined to follow the custom and advice of those who, like Lambert Lack, say "in the majority of cases the mucous membrane, unless very extensively diseased, will soon become healthy when free drainage has been provided, and its removal by baring the bone, only delays the cure and opens the way to spread infection." At the first operation, no fistula was found leading to the middle fossa, nor any evidence of dehiscence in the petro-squamous suture, yet under similar conditions again, I would enter the middle fossa if any suspicion of the tegmen presented itself, even in the absence of pronounced clinical signs. Should no pus be found after exposing the dura it could be protected by frequent dressings. The occurrence of the temporo-sphenoidal abscess seemed the last straw necessary to preclude my patient's restoration to health. Did this arise from the epidural focus of pus in the middle fossa? From the proximity of the two and the experience of others, it seems reasonable to suppose it did, but we know that such in-

fection could have originated elsewhere, and if elsewhere then breaking down the tegmen would have availed nothing and been no barrier to the formation of the cerebral abscess. Finally having opened two abscesses already, in the area where the intensity of the disease had manifestly expended itself, viz.: the mastoid sub-periosteal abscess, and the abscess over the lateral sinus and good drainage afforded, it was reasonable to conclude that the source of existing symptoms had been eradicated when these foci were removed. Although unfortunately, the case had not a successful termination, it was, I think, both interesting and instructive, and as such I offer it to the Society, feeling as I do that the tendency of the profession to report successful cases only, is generally too prevalent. For that matter, the results of a so-called successful operation are not always lasting in these cases, for repeatedly it has happened that one, two, or four weeks after the pus has been evacuated, an unfavorable outcome has supervened.

A CASE OF MULTIPLE TRAUMATIC PERFORATION OF THE SMALL INTESTINE.

BY

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The following case appears to me to be of sufficient interest to report, showing as it does, what the peritonæum may do under certain circumstances with no more surgical aid than a mere drainage incision.

N. P., a Siamese lad, 14 years of age, was admitted to the Police Hospital on the evening of January 12th, 1909, having some two hours previously been shot in the abdomen at close range with a large calibre revolver. He presented an irregularly circular wound about one-half inch across just inside the ant. sup. spine on the right side. There had been very little bleeding from the wound; there was no escape of gas or fluid nor any viscus present. The abdomen was generally resistant, both flanks were dull, but the dulness was not movable. Liver dulness appeared normal. The pulse was over 160 respirations, rapid and shallow, pupils dilated and expression anxious. The patient did not complain of pain and had passed clear urine since receiving the injury. The bowels had not moved. There was a good deal of shock, nevertheless the abdomen was opened immediately in the mid-line, below the umbilicus, by an incision about 3 inches long. Much blood and some fæcal material of small gut consistency came away. The small intestine was delivered and almost at once a wound perforating both sides of the gut was found. Near it was a laceration on the anti-mesenteric side of the gut about one and one-half inches long. There was also much bruising of the mesentery between these two. The three wounds were closed up

in the usual way—considerable difficulty being found in case of the laceration, as there was none too much tissue. In the meantime the patient's condition had become very bad.

Strychnia and brandy had very slight effect on it, and haste was very clearly indicated. Further examination, however, showed seven more traumatic perforations of gut and mesentery within a distance of six feet.

All this and his condition made the case seem so hopeless, that the abdominal opening was closed with through and through sutures after a large drainage wick had been placed in the lower angle extending freely into the abdomen.

For the next two days the condition was:—tongue dry and glazed, pulse 160-170, temperature 100°-102°, respiration shallow and rapid, Facies Hippocratica, stercoraceous vomiting, mental state clear, much distended board-like abdomen, free fæcal discharge through the wound and no motions per rectum. He was freely stimulated, given all the milk he could take and repeated large enemas. The drainage wick was removed on the second day and not reinserted. On the third day a small amount of fæcal matter was passed by rectum, and daily thereafter the quantity coming away naturally increased, and that by the wound decreased. With the first stool by rectum the boy's condition improved and it did so steadily and without further set back until on February 6th the fistulous opening had closed spontaneously and completely. On February 12th the boy was up and about and it was found that he had been eating rice, bananas, fish and cakes for ten days previously. He was discharged well on February 19th.

A CASE OF CHOLECYSTITIS, VOMITING OF GALL-STONES.—RECOVERY.

BY

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The following case is reported on account of its rarity.

Patient is a Mexican woman aged 60, married, 7 children. Personal history: Has suffered from flatulent dyspepsia for 30 years. She has had numerous attacks of colic, accompanied by vomiting during this same period. These attacks never lasted long, and though severe at the time never laid her up for more than one day. The pain was always worst on the right side and was frequently referred to the right shoulder. She never was jaundiced, or noticed clay-coloured stools.

In September, 1908, she was laid up with some fever, of what nature she does not know. She was in bed for two weeks, five days of which she was delirious. She had no pain nor cough at this time.

Present illness: On April 24th, 1908, I was called to see her, and found her complaining of great pain in the abdomen, and vomiting. The pain had commenced three days previously, in the right upper quadrant of the abdomen, and was referred to the right shoulder. She had vomited several times and had had no passage by the bowels since the pain began. She had had chills every day; but they did not come regularly.

On examination I found the following condition: Temperature, 103.2; pulse, 108; resp., 26; time, 9 p.m. Heart and lungs, normal. Arteries very sclerosed. Pulse regular in volume and rhythm, bounding, high tension. Abdomen distended, especially in the right upper quadrant, where a bulging was distinctly visible, extending from the costal margin to the level of the umbilicus and from the middle line to the anterior axillary line. This mass was seen to move up and down with respiration. Respiration was very shallow. There was no visible peristalsis.

On palpation the abdomen was resistant, especially over the mass. The whole abdomen was tender; but it was extremely so over the mass. This mass had a definite rounded outline, was firm to the touch, and was attached to the liver. It could be felt extending into the loin. Nothing else abnormal was found. Spleen not palpable. Urine 1022, acid, no albumen, no bile, no sugar.

A diagnosis of empyema of the gall-bladder was made and operation was advised. This was absolutely refused. Hot linseed meal poultices were applied constantly, changing them every half hour. The bowels were moved with an enema. For about ten days she had recurring chills every day and sometimes two or three in a day. However, the mass gradually diminished in size, and the pain gradually disappeared. During this time she had no colic; but just the steady pain of localized peritonitis. She was delirious at night for seven nights. The temperature and pulse gradually came to normal, by the end of three weeks. She got up at the end of a month, although there was still a mass in the region of the gall-bladder the size of an orange. This, however, was no longer tender. She had two mild attacks of pain during the summer, lasting two and three days respectively. She had another severe attack in September, 1908, similar to that in April, complaining of pain in the right upper quadrant of the abdomen and vomiting and chills. The same condition was found as in the first attack. There was distension of the abdomen with very marked muscular resistance of the abdominal walls. The mass was about the size of a fist and very tender; it gave a sensation of fluctuation when palpated with one hand in the loin and the other hand on the abdomen.

She was again advised to submit to an operation, but she again refused, and so was treated as before with hot poultices. She rapidly improved and was able to get up in ten days. The mass still remained about the size of an orange. On October 16th, 1908, she was again seized with pain and vomiting and chills. That night she was delirious all night, and when I saw her in the morning she looked very ill and complained that the pain was nearer the middle line than usual. The same abdominal conditions were found. While I was there she had a sudden very acute pain accompanied by a feeling of faintness, and then the pain in the abdomen seemed less acute. Shortly after this she vomited up eight facetted gall-stones about the size of a pea, along with some stinking pus. In the afternoon she had a repetition of the pain and she vomited up eight more gall-stones. She rapidly improved from this time on and was able to get up in three days.

Since then she has had three attacks of chills, but has not been in bed for more than a day at a time. The pain has never been severe since she vomited the gall-stones. The last attack was in the latter part of January. She has gained greatly in flesh and says that she no longer suffers from flatulency or distress after eating. When I last saw her, March 23rd, 1909, she still had the mass in the region of the gall-bladder; but it was only about the size of a hen's egg.

The rarity of cases vomiting gall-stones is seen by the fact that Mayo Robson mentions only two cases in his work on "Diseases of the Gall-Bladder and Bile Ducts," one of which he saw himself. This one vomited several gall-stones, and recovered without operation. The second was reported by Jeafferson.(1) She vomited a gall-stone and died a week later; a fistula leading from the gall-bladder to the stomach was found post-mortem. Murchison (2) says that in all probability all vomited gall-stones must have entered the stomach by a gastric fistula. These fistulæ are comparatively rare as is seen by referring to the figures collected by Courvoisier and Naunyn of all published cases. Out of 384 fistulæ leading from the biliary passages, only 12 lead to the stomach. Eight lead from the gall-bladder to the stomach, and four from the liver to the stomach; there being no case of fistula from the hepatic, cystic, or common, bile ducts to the stomach.

The figures of Courvoisier and Naunyn are as follows:—

Fistulæ between the biliary passages themselves	8
Fistulæ between the biliary passages and stomach	12
Fistulæ between the stomach and liver	4
Fistulæ between the stomach and gall-bladder	8

Fistulæ between the biliary passages and duodenum	108
Fistulæ between the duodenum and common bile duct	15
Fistulæ between the duodenum and gall-bladder	93
Fistulæ between the jejunum and gall-bladder	1
Fistulæ between the ileum and gall-bladder	1
Fistulæ between the biliary passages and colon	50
Fistulæ between the colon and gall-bladder	49
Fistulæ between the colon and common bile duct	1
Fistulæ between the biliary passages and urinary organs	6
Fistulæ between the biliary passages and thoracic organs	10
Fistulæ between the biliary passages and abdominal walls	184
Fistulæ between the biliary passages and retro-peritoneal tissues	4
	384

Thus it is seen that only .03 per cent. of all biliary fistulæ lead to the stomach, and in these cases the patients very seldom vomit the gall-stones. These figures also show that by far the greater number of the fistulæ begin in the gall-bladder. During his operations Mayo Robson has only found a gastro-biliary fistula on one occasion. These references are all found in Mayo Robson's work on "Diseases of the Gall-Bladder and Bile Ducts."

CAPSULE FORCEPS IN CATARACT EXTRACTION.

BY

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The introduction of a subject of such an essentially practical nature, including as it does pathological features of a more or less simple yet none the less interesting character, is I feel sure in accordance with the wishes of your committee who requested that the papers brought before this section should be made as practical as possible. The almost universal practice of my teachers, Axenfeld, Fuchs, DeLapersonne, and Treacher Collins, the experience which I have obtained from cases of my own, experimental work done upon the cadaver, added to a pathological appreciation of operative technique, warrants the selection of the subject. It is my wish to appeal to all interested in ophthalmic surgery and more particularly to those whose practice it has been, either from ultra conservatism or from inexperience with capsule forceps, to adhere to the older method of employing the cystotome in all cases of extraction.

Read before the Canadian Medical Association, Ottawa, 10th June, 1908.

The special technique in the use of forceps is briefly as follows. After the initial corneal incision has been made, preferably with a conjunctival flap covering its uppermost point, an iridectomy is usually performed. After the segment if iris has been excised, when one wishes to release the lens cortex from its enveloping capsule and zonnule of Zinn, the capsule forceps are now employed. The instrument is held in the right hand and the patient directed to look downwards when the globe is held with a pair of fixation forceps held in the left hand, if movement of the eyeball cannot be kept under reasonable control by the patient. The tips of the capsule forceps are now introduced, closed, through the lips of the corneal incision into the anterior chamber, and are carried downwards as far as the lower pupillary margin, or even slightly lower, beneath the iris and to one side. With the blades of the instrument in this position within the chamber, they are allowed to open, and after very gentle pressure upon the underlying capsule the membrane is caught between the sharp teeth of the tips when they are brought together again. The first rent in the capsule is made by a gentle to and fro movement and the tear is continued in a crescentic or semilunar direction, following the margin of the pupil, the forceps being withdrawn at the point where they were originally inserted. Should the details of this technique have been followed correctly, a piece of hyaline capsule tissue should be seen included between the teeth of the forceps and this one may float off in a watch glass of distilled water in order to demonstrate its presence. The subsequent course of the operation is proceeded with in the usual way.

Some of the advantages to be gained by following this procedure are briefly as follows: One pair of forceps is suitable for either eye, not requiring to be bent or twisted into various shapes as is so frequently necessary in the case of the cystotome. An additional advantage is that frequent sharpening of the instrument is not necessary, a precaution which must often be attended to in the case of the cystotome.

After the torn capsule has been removed from the chamber, no postoperative cataract or capsule shreds remain about the pupillary area requiring subsequent discission; as soon as the eye has recovered its equilibrium a refraction is possible and a correction may be prescribed at once without having to submit the patient to a second operation, a procedure as frequently unexpected by the patient as undesired by the operator. Although much may be claimed for peripheral capsulotomy, a tag or adhesion may escape section at one point or another, the membrane falling back over the pupillary area after the lens cortex has been expelled. One is therefore only able to feel confident when one sees for oneself that a piece of membrane has actually been removed from the

anterior chamber, by noting it included between the teeth of the forceps, or after floating it off in distilled water.

With removal of the lens capsule and after the employment of mydriatics, or occasionally of myotics, the formation of synechiæ from a post-operative iritis is less likely to occur. Further, a great deal of the post-operative toilet of the wound to remove particles of capsule from between the lips of the incision is not rendered so necessary. Again, when a large piece of capsule has been removed, the whole cortex is more likely to be extracted and fewer lens fibres are consequently retained in the posterior chamber.

A feature of the utmost importance, for which the capsule forceps is mainly responsible, is the more ready tendency towards healing by first intention. By the older and more conservative method of employing the cystotome some shreds of capsule very frequently find their way between the lips of the wound, and primary union is in consequence not only occasionally delayed but actually prevented. With the remains of the capsule completely removed and with the additional support of a good conjunctival flap, primary healing is almost positively assured, and such unfortunate complications as a break of the incision with loss of aqueous after some involuntary spasm as coughing or sneezing, are seldom if ever met with.

To emphasize my last argument, I have prepared sections from a series of cataractous eyes, each eye having been removed post mortem, practically an equal length of time having elapsed after operation before death occurred in each case. Fig. 1 is an instance of a normal case, where after a perfectly clean and uncomplicated incision, primary union is seen to be well under way. The bridging over of the wound by new fibro-connective tissue elements has produced a globe where weakness at the point of incision need not have been subsequently feared. The healing at this point has been complete, although Descemet's membrane and the stump of the iris have barely escaped inclusion. A second case shows a section of a perceptibly weakened globe: union here is of the weakest possible kind, consisting of a form of granulation tissue which has extended from the epithelial elements of the bulbar conjunctiva downwards into the wound. Union of any kind in the lower two-thirds of the incision has been completely prevented by the inclusion of a large piece of hyaline tissue. A sudden break in the chamber with loss of aqueous, not to mention other equally serious complications, would not be unexpected in a globe so evidently weakened by an included membrane. (Fig. 2) A definite measure of support to this incision has been afforded by a conjunctival flap which, superficially at least, has succeeded in hold-

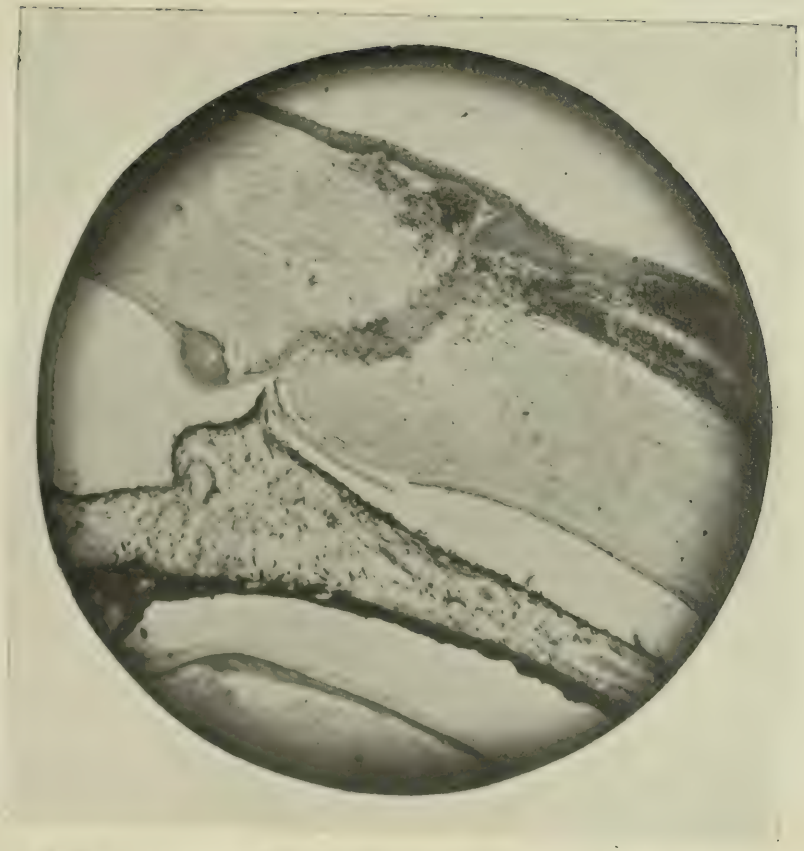

Fig. I. Section of eye removed post mortem two weeks after operation. Healing of corneal incision by primary intention

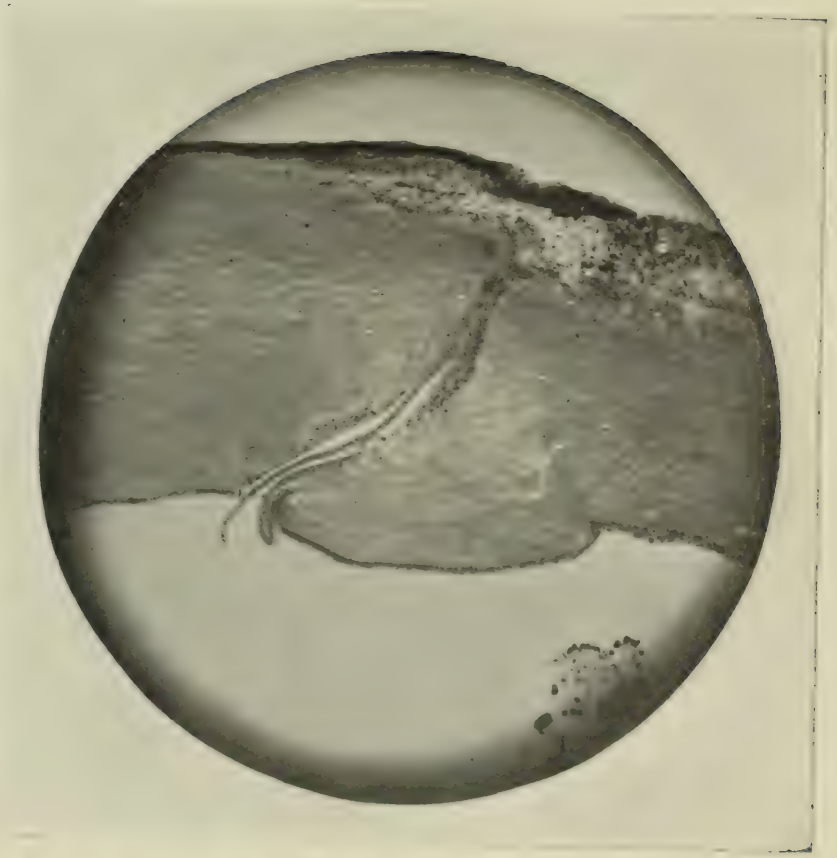

Fig. II. Section of eye removed post mortem thirteen days after operation. Healing retarded, due to included membrane between the lips of the corneal incision.

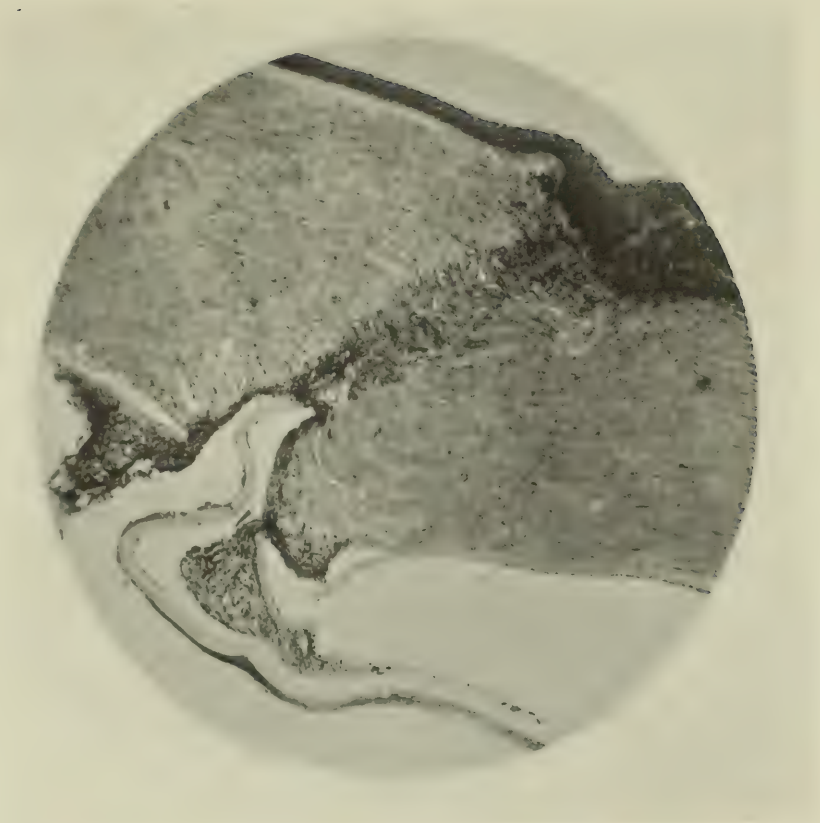

Fig III. Section of eye removed post mortem. A distinctly weakened globe shown to be due to inclusion of anterior lens capsule. Infiltration of leucocytes in anterior chamber as well as about the base of wound due to the same cause.

ing the lips of the incision together. Another instance of impaired union is seen in Fig 3. The globe, it is true, is not weakened to the same extent as in the last case where union has practically had to be maintained by a conjunctival flap and some granulation tissue. The outer half of the globe is held together by definite fibrous tissue, as well as by a good conjunctival flap, although a distinct element of weakness must result from the non-union of the lower half of the wound due to an included anterior lens capsule. An infiltration of the new connective tissue elements about the wound, the presence of leucocytes in large quantities about the innermost part of the incision in the neighborhood of Descemet's membrane, as well as on the anterior surface of the lens capsule within the chamber, would point to an inflammatory reaction for which the included capsule should be held responsible.

I am ready to admit that there are certain cases where other procedures might be followed more safely; cases of a very friable zonnular ligament, as well as those where a cataract has complicated myopia, might perhaps be better treated with the cystotome, the fibres and capsule being subsequently removed by the very careful use of an irrigator. Yet all must agree that the employment of an irrigator is attended with its own dangers as far as loss of vitreous is concerned.

The objection is held by some that by employing forceps additional pressure has to be exerted upon the lens, and that possible rupture of the suspensory ligament and dislocation of the cataractous lens into the vitreous may result. This, however, need not of necessity follow. In order to obtain a grip of the capsule very little extra pressure need be exerted upon the lens than when the point of the cystotome punctures the capsule; quite naturally if roughness is resorted to, or if the eye is not able to be kept under control, accidents will happen with one instrument as with the other.

The pattern most commonly seen resembles in many respects an ordinary iris forceps, with the tips curved slightly upwards, the main point of difference being that the small, sharp teeth are directed downwards, as well as inwards, instead of inwards only as is the case of the iris forceps. A pair of forceps which I have found most useful and which I have employed a number of times at the Royal Victoria Hospital with satisfactory results was made for me by Messrs. Wulfing-Luer, of Paris. The handle is approximately 8 cm. long, tapering to a slender tip, where an extension arm of about 8mm. is welded at an angle of 120° to each blade. These tips are curved concavely below and conform with the underlying convex surface of the lens. The tiny, sharp teeth are directed downwards and inwards and interlock at the distal ends of the tips.

This instrument has one or two advantages over other patterns which I have so far seen in use. After inserting the tips into the chamber, pressure may be more evenly distributed over the whole zonnular ligament, and consequently minimised at any one particular point where it must of necessity be exerted in other patterns where one point only is directed, as well as in the case where the cystotome is employed. The blades or tips of the forceps being curved concavely downwards an entanglement of the iris fibres need not occur. I am considering the advisability of further modifying this instrument, and of inserting an additional set of teeth nearer the heel of the tips in order that a more complete grip of the capsule may be obtained and that the removal of a larger piece of capsule from the pupillary area may be assured.

In conclusion I wish to acknowledge with gratitude the kindness of my friend Dr. Byers for supplying me with the specimen illustrating Fig. 3, a pathological representation of a number of the more important clinical findings which I have attempted to bring before you for consideration in this paper.

The Alberta Medical Association meets in Calgary on August 18th, 19th and 20th. This is just before the meeting of the Canadian Medical in Winnipeg and is intended for the convenience of the Eastern men who visit the West. The Association extends a cordial invitation to all members of the profession to attend.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

EDITED BY

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PREVENTION OF TUBERCULOSIS.

The campaign against tuberculosis has become general throughout Canada. There are few towns without a well-organized association for propagating knowledge of the means by which the disease may be prevented or cured, and the intelligence is spreading to the remotest homes. Few diseases are so well understood as tuberculosis; and, according as knowledge becomes more general, we may well expect a diminution in the death rate and in the misery which it entails. Probably the most efficient method of preventing the spread of the disease is to insist that spitting in public places is not only a disgusting nuisance, but a crime against the public welfare, and, what is more to the point, against the civic by-laws. Few communities are now so benighted as not, in theory at least, to enact suitable regulations against the practice.

The Railway Commission is the most recent public body to make drastic regulations, and every one is aware by this time that what the Railway Commission says must be done will be done. Application for a rule was made by the Montreal Board of Trade and the Commission now orders every railway company as follows: (1) to keep all its passenger stations, waiting rooms, and closets clean, ventilated and regularly disinfected, and have monthly reports from employees in charge of such work as to the state of these rooms; (2) to keep all its passenger cars clean, ventilated and in cold weather, properly heated, and to have at least one employee on every train whose duty it will be to see that this

is done; (3) to adopt a by-law prohibiting spitting in stations, waiting rooms, closets, or other premises of the company or on the platform of cars except in receptacles suitable for the purpose, and providing a penalty for breach, such notices in Quebec to be in French as well as English; (4) to provide cuspidors in stations and in the smoking compartment of passenger cars and to have them cleaned at least every 48 hours; (5) to fumigate promptly all cars known or suspected to have carried a passenger suffering from an infectious disease; (6) to fumigate all sleeping cars regularly in service at least once in every thirty days. A penalty not exceeding $50 is provided for every infraction of the rules by the company, while every employee whose duty it is to carry out the order shall be liable to a penalty of not less than $2 nor more than $15 for every failure to do so.

Every person who has occasion to travel by railway should constitute himself an agent for putting these regulations in force, until at length to spit in a public place will be considered an act of obscenity.

THE COMMON HOUSE-FLY.

We have mastered malaria and yellow fever by fixing the guilt for the propagation of these diseases where it belongs, upon two varieties of mosquito. Let us not be content with that, but institute a fresh campaign against the common house-fly, which is one of the worst pests of country life. We can no longer affect ignorance of the evil results which are wrought by this ubiquitous insect, not only in the annoyance which it causes but by the actual causation of disease. There is clear evidence that the typhoid bacilli are transmitted as well by flies as through impure milk and a polluted water supply. In a report made to the Merchants' Association of New York it was shown by Dr. D. D. Jackson that raw sewage discharged into large or small bodies of water furnished feeding ground for flies from which they gathered and spread the germs of typhoid fever and other intestinal diseases. Dr. L. O. Howard, of the Bureau of Entomology, at Washington, has collected specimens of the house-fly from all parts of the United States from Maine to California, and whilst he has differentiated at least five varieties he concludes that all may be the means of conveying infection.

So far as we are aware nothing has been done in Canada to minimize the evils of this pest. This division of public education might well be included in the campaign against tuberculosis. The remedy is cleanliness as is well set forth in the rules of the Chicago Board of Health:

Screen all food and keep flies away from it. Keep the streets clean. Keep stable manure—breeding place for flies—in a vault or pit or

screened inclosure and sprinkle its surface with chloride of lime. Quickly cover up food after a meal and bury or burn table refuse. Keep damp cloths near meat dishes, milk jugs, and other food receptacles. Burn pyrethrum powder in the house. It will kill most of the flies and those it does not will fall stunned, when they may be swept up and burned. Sticky fly-papers are a second-rate palliative. Remember that the exposure of any kind of refuse near a dwelling furnishes a breeding place for flies, and if food is exposed the flies will deposit germs upon it.

A rather more extensive series of rules has been prepared by the Merchants' Association, of New York, which we take pleasure in calling to the attention of the profession and of the public:—Keep the flies away from the sick, especially those ill with contagious diseases. Kill every fly that strays into the sick room. His body is covered with disease germs. Do not allow decaying material of any sort to accumulate on or near your premises. All refuse which tends in any way to fermentation, such as bedding straw, paper waste and vegetable matter should be disposed of or covered with lime or kerosene oil. Screen all food. Keep all receptacles for garbage carefully covered and the cans cleaned or sprinkled with oil or lime. Keep all stable manure in vault or pit, screened or sprinkled with lime, oil or other cheap preparation. See that your sewage system is in good order; that it does not leak, is up to date and not exposed to flies. Pour kerosene into the drains. Cover food after a meal; burn or bury all table refuse. Screen all food exposed for sale. Screen all windows and doors, especially the kitchen and dining room. Burn pyrethrum powder in the house to kill the flies. Don't forget if you see flies, their breeding place is in nearby filth. It may be behind the door, under the table or in the cuspidor. If there is no dirt and filth there will be no flies.

Reviews and Notices of Books.

AIDS TO MEDICINE. By BERNARD HUDSON, M.D., M.R.C.P., London. Baillière, Tindall & Cox, London.

This little book is a brief, concise, but accurate ready reference handbook for students and general practitioners giving at a glance the principal salient points in the Etiology, Pathology, Symptoms, Physical signs, Diagnosis, Prognosis and treatment of the various diseases. It takes up the specific infectious diseases, diseases of the respiratory and cardio-vascular systems, of the blood and ductless glands, of the nervous system, of the digestive system and the various constitutional diseases, intoxications, and those due to animal parasites.

OPERATIONS UPON THE UTERUS, PERINEUM AND ROUND LIGAMENTS. By W. J. STEWART MCKAY, M.B., M.Ch., B.S.C., Senior Surgeon Lewisham Hospital for Women and Children, Sydney; Member of the Royal Society of Medicine, London; Ballière, Tindall & Cox, 1909; Crown 4to xvii, 454, 148 plates. Price, 21s. net.

The express object of the book is "to point out how the obstetrician should deal with the immediate lesions of the vagina and perineum, and in the next place to describe how these lesions, when neglected, may be dealt with later on by the operator, whether he be a general practitioner or specialist."

The first chapter deals with the anatomy of the pelvic floor, the mechanism of lacerations, and the treatment of recent tears. This, probably the best part of the book, is very clearly written and unusually well illustrated. The author believes that certain median tears do not require immediate suturing, but it is doubtful whether his explanation of which should, and which should not be sutured, will be clear to the average practitioner, already too willing to extend the latter class, and we consider it would have been better to advise immediate repair of any laceration, however slight. When operation is necessary, those suggested are those usually described in modern text books.

Chapter II deals with Lawson Tait's perineorrhaphy, both the "V" and "H" operation being extensively described, though the "V" operation is admitted to be of comparatively little value. The "H" operation, as described by its originator, is altered by the author, who suggests dissecting out and suturing the ends of the torn sphincter; a step the necessity of which is evident to anyone who has ever undertaken the operation. It is doubtful whether the after treatment recommended, namely, to open the bowels on the third day, will find favour with many operators.

In Chapter III the author deals with the operations for relaxed vaginal outlet, and in this follows closely the teaching of Howard Kelly. He omits, however, the most recent feature introduced by Kelly and what is probably the most important step, i.e. the piercing of the fascia, the drawing in of the levator ani from either side and their fixation into the perineal body. Chapters IV, V, and VI, deal with rectocele and cystocele and operations on the cervix; the usual procedures are described.

Chapter VII deals with displacements of the uterus. The author evidently favours Alexander's operation, and would widen the scope to include cases in which adhesions are present, and advocates freeing these

adhesions by means of the finger passed through the internal ring into the peritoneal cavity. Other more modern operations for suspension and fixation of the uterus are also described, and the danger of fixation during the child-bearing period is pointed out.

Chapter VIII, the longest in the book, deals with curettage of the uterus. The indications for this operation seem to be very varied, and some ten pages are devoted to the danger of perforation of the uterus when it is undertaken. There is slight mention of the value of microscopical examination of scrapings, though this might occasionally determine the justifiability of the operation. The curette is recommended in the treatment of post partum infection and in certain instances "the finger may be introduced and curettage performed by the nail."

The last chapter deals with dysmenorrhœa and contains a description of a cervix splitting operation which we believe might have been also attributed to Howard Kelly. The book is sufficiently well written to render unnecessary the frequent use of italics and heavy type which mars an otherwise good appearance. It is unusually well illustrated, thanks to adaptations from the recent and more extensive works on gynæcology as well as some drawings from sketches by the author. It will probably find favour, for, in the words of the introduction, "it is common knowledge that the bulk of the profession are fired with the desire to operate."

H. M. L.

TEXTBOOK OF EMBRYOLOGY. By FREDERICK RANDOLPH BAILEY, A.M., M.D., Professor of Histology and Embryology, College of Physicians and Surgeons, New York, and ADAM MARION MILLER, A.M., Instructor in Histology and Embryology, College of Physicians and Surgeons, New York. Published by William Wood & Co., New York.

This is a well written and well illustrated textbook of 640 pages. The letter-press is clear and good, and the illustrations are well executed. The scope of the work is the development of the human embryo, with just enough reference to other forms to make the processes in the human embryo intelligible. It is therefore a book pre-eminently suited to the needs of medical students. The authors are particularly to be praised for the clearness with which they have dealt with the most difficult subject of the "formation of the layers." Under this phrase are understood the processes of segregation, of ectoderm, endoderm and mesoderm. These processes in the human subject and in mammalia generally have been profoundly modified by the relations which have for so long sub-

sisted between the embryo and the womb of the mother. In order therefore to explain the formation of layers in mammalia Messrs. Bailey and Miller have given a number of excellent figures of the eggs of reptiles and amphibia in early stages of development, by means of which the steps in the modification of the "formation of the layers" can be distinctly followed. It is satisfactory to note that they have shown a wise conservatism in *not* following the latest theories on the subject. These, as expounded by Hubrecht Lwoff and others of the same school, would turn all our conceptions topsy-turvy, and we venture to predict that their popularity will be of exceedingly limited duration. In the accounts which they give of the detailed development of the various organs, the authors of the work under review have distinguished themselves by the number of reconstructions from sections which they have figured. From an experience of many years in teaching embryology, we are convinced that the average student finds great difficulty in picturing to himself the anatomy of organs from mere sections, however carefully chosen or well-figured. The value of these reconstructions is therefore very great and it is a distinct pleasure to come across a text-book containing so many of them. Finally we commend the manner in which the student's attention is constantly directed to the explanation of congenital defects, which is afforded by embryology. We warmly recommend this text-book to all readers of the JOURNAL.

E. W. M.

DISEASES OF THE HEART. By JAMES MACKENZIE, M.D., M.R.C.P. Price: $7.50. London: Oxford Medical Publications; Toronto: D. T. McAnish & Co., 1908.

The appearance of this work has made the world richer. Much of the information contained in it is based on observations first made by Dr. Mackenzie himself. Much also is derived from experiments made by younger men under his direct inspiration and guidance. No other man could have written a book to fill just the place that this does. Dr. Mackenzie has probably done more than any one else in the English-speaking world to apply the facts and methods of physiology to the diagnosis and treatment of heart disease. He regards diseased hearts from the functional view point. His chief enquiry is not what valve is diseased, but what function of the heart muscle is threatening to become exhausted. He has developed a technique based largely upon the graphic methods of the physiological laboratory by which he is able to diagnose the functional condition of the heart. The outstanding feature of his technique is the use of simultaneous tracings the arterial and venous

pulses in addition to the physical and symptomatic examination of the patient as ordinarily practised.

The author has established the relationships between the symptoms and signs and the functional capacity of the heart in such an enormous number of cases by means of the graphic method that he is now able to teach others how to estimate the state of the heart in many cases without the graphic method. He has done much to bring order out of chaos in the differentiation and explanation of many types of arrhythmia. He has recently given special attention to the absolutely irregular hearts of advanced mitral disease, and believes he has found an explanation in the shifting of the seat of origin of the heart beat from the mouths of the great veins to a mass of primitive or embryonic cardiac tissue situated in the wall of the right auricle and known as the auriculo-ventricular node.

Dr. Mackenzie has approached the question of treatment along new and original lines, and has done much to determine the effect of physical procedures of various kinds and also of drugs upon the functional capacity of the heart. The book is written in as simple a style as the subject permits of, and the reader's attention is not diverted from the great outstanding facts and principles by an undue mass of detail. The chapters are short, the division of subjects is clearly made, and the publisher's work is only surpassed by the value of the text.

W. S. M.

Diseases of the Eye. By Stephen Mayou, F.R.C.S. London, Oxford Medical Publications, 1908; Toronto: D. T. McAnish & Co.

The author in his preface presents this little work as one intended to help those who are beginning the study of ophthalmology, or as a short work of reference for the general practitioner. As such this volume will certainly serve its purpose well. It is a clear, concise presentation of the subject following the generally accepted ideas, although several of the more recently introduced methods with which the author has had practical experience are included.

The section on diseases of the fundus oculi is dealt with rather briefly, as in the writer's opinion those who are sufficiently advanced in the subject as to be able to use the ophthalmoscope should consult larger works for reference. Elementary optics and refraction are treated in an unusually interesting manner, the orderly description assisting naturally in an intelligent appreciation of a rather difficult branch of ophthalmology.

One point in particular in which the work is to be commended is the admirable and liberal manner in which the book is illustrated. Mr.

Mayou as a pathologist has appreciated his particular advantage over writers of the majority of small text books, and, in addition to a clinical picture of diseased conditions, has prepared a large series of microscopic sections which very materially assist in demonstrating the morbid changes occurring in the various ocular disorders. The way in which the book is printed and the number as well as the quality of the illustrations would do credit to a more pretentious volume.

An appendix giving a number of the commoner prescriptions used in eye surgery, as well as the indications calling for their employment, lends an added value to this little book. The work will be welcomed by the student who wishes a brief yet intelligent conception of ophthalmology before he has occasion to resort to the larger treatises.

F. T. T.

Refraction and how to Refract. By Jas. Thorington, A.M., M.D. Philadelphia: P. Blakiston's Son & Co., 1909. Price, $1.50, net.

The fourth edition varies little from the third edition of this deservedly-popular text-book. The plan of the work is good, and the author makes his subject very clear. Criticisms can, of course, be made, though they may not always concern essentials. Distinct omissions, however, are the failure to take note of the spherical aberration of the lens, in refracting under mydriasis, and of the variation in the power of the ciliary muscle from the supposed fixed standards of Donders, as recently pointed out by Duane. Further, the paragraph dealing with convergent strabismus inefficiently expresses the modern conception and treatment of this condition. But for beginners and for those who do not wish to go too deeply into the subject (for those, indeed, for whom it was primarily written) the work can be highly recommended.

W. G. M.

A System of Diet and Dietetics. Edited by G. A. Sutherland, M.D., F.R.C.P., London. Oxford Medical Publications, 1908. Canadian Agents: D. T. McAnish & Co., Toronto; pp., 893. Price: $9.00.

In these days of bulky "systems" of five to ten volumes it is peculiarly pleasing to find one that is comprised in a single manageable volume of 893 pages, and yet contains a sufficiently full and elaborated account of the matters whereof it treats, written in good English and in coherent style without any evidence of haste. As stated in the preface, the intention has been to produce a work in which "contributors were asked to

give their own views and experiences, rather than to make a collection of all the views of different authorities." Although the book is thereby rendered more dogmatic in tone, it may prove of more value to the practitioner, and serve as a guide in his work rather than be a mere cyclopaedia of facts and opinions. At the same time the views of the leading authorities have been included and critically considered.

Certainly this plan has produced a far more readable volume than is usual where the text is marked by exasperatingly frequent references and foot-notes—to which the average reader has neither the time nor the inclination, and possibly not the means, of referring. The volume is divided into XXVIII chapters. Chapters I-IX deal with general and preliminary considerations, while the remaining chapters are devoted to the practical application of dietetic principles in disease, with sections on diet in old age and in infancy. In a work of such general excellence it is difficult, not to say invidious, to select any particular contribution for special commendation. Without, however, detracting from the merit of any of the other sections, it may be said that the chapters on "The Evolution of Man's Diet," and on "Alcohol in Health and Disease," by Dr. Harry Campbell, will probably be read with peculiar interest on account of their "unusual" quality. Some of the statements in the latter must be rather a shock to prohibitionists, e.g., that alcohol is beneficial in hastening the elimination of congenital degenerates, and that the degeneration caused by alcohol is not inherited. Among the more elaborate articles may be mentioned the chapters on "The Results of Experimental Work on Diet," by Dr. E. D. Spriggs, "Patent and Proprietary Foods" (with analysis), by Dr. Edmund Cantley, "Diet in Tuberculosis" (with excellent diet lists for all classes and conditions of individuals), and "The Feeding of Infants and Children in Health," by the Editor.

The chapter on "Diet in Diabetes" is not very satisfactory. It is too general and does not give standard diets for diagnostic and prognostic purposes.

The publishers must be commended for producing a volume that is well printed, opens easily, and (owing to abscence of glazing) is light and easily handled—a pleasing contrast to most medical books published in America.

THE SURGERY OF THE EAR. By SAMUEL J. KOPETSKY, M.D., illustrated with sixty-three half-tone and line drawings, eight charts and four coloured plates. New York, Rebman Co., 1123 Broadway.

The author, believing that the present tendency towards specialism is increasing, and as a result, there will be those who will devote them-

selves exclusively to the treatment of the surgical diseases of the ear; in order, therefore, to meet the needs of such a class, he has attempted to supply a book which shall embody all the additions to our knowledge of the surgery of the ear. In this work, he has correlated the extensive literature with personal experience and observation, the whole being adapted to the needs of the medical student, the practitioner, and the specialist. The author, in attempting to deal with the subject in so comprehensive a manner necessarily falls short in certain of his endeavours; for example, it is to be noted that, under the subject of new growths, only one variety (the polypoidal) has received consideration. Inflammatory affections of the cartilage are not even touched upon, nor do we find any reference to examination of the blood as an aid in diagnosis. The more recent work of Barany on the diagnosis of affections of the labyrinth, has been quite overlooked. The illustrations are fairly well represented, but the type and paper do not commend themselves. One may well hope that, in any subsequent edition, the treatment of the subject under consideration will be more comprehensive.

Medical News.

INTERNATIONAL MEDICAL CONGRESS, BUDAPEST.

The following are the "accommodation orders" for the XVIth International Medical Congress, to be held in Budapest. The period of validity for such accommodation-orders is 7 days with hotels and 8 days with private dwelling houses, and it is to be understood, that the day of the arrival with the hotels is the 28th of August, but with private dwelling houses the 27th of August. Should the arrival in Budapest take place after the 27th of August—(with hotels after the 28th of August)—and the departure from Budapest before the 4th of September, no reimbursement will made for the time the lodgings are not used.

IN HOTELS.

Arrival on the 28th of August.—Departure on the 4th of September. Rent for a stay of 7 days.

Prices in Kronen.—Ser. A., single bedded, K. 70-140; double bedded, K. 84-210; three bed, K. 105-245. Ser. B., single bedded, K. 48-69; double bedded, K. 64-83; three bed, K. 80-104. Ser. C., single bedded, K. 21-47; double bedded, K. 35-63; three bed, 42-79.

IN PRIVATE DWELLING HOUSES.

Arrival on the 27th of August.—Departure on the 4th of September. Rent for a stay of 8 days.

Prices in Kronen.—Ser. D., single bedded, K.51-70; double bedded, K. 15-100; three bedded, K. 91-115. Ser. E., single bedded, K. 31-50; double bedded, K. 46-75; three bedded, K. 61-90. Ser. F., single bedded, K. 16-30; double bedded, K. 30-45; three bedded, 45-60.

Such chambers may be engaged in the following way:—The person who orders lodgings indicates in which series and at what price he desires a single bedded, a double bedded chamber, or one with three beds and whether in an hotel or in a private house. It is left to the choice of him who engages the room to fix the price between the maximum and the minimum rent of the respective category. The amount corresponding with the price chosen is to be transmitted in advance. In return for it, and in conformity with the order received, the Committee will remit to the sender an accommodation order for appropriate lodgings. For this service a charge of 8.50 kronin per person will be made and should be sent with the order.

In case the renter should be prevented from taking possession of the lodgings—notice of which, however, has to be received before the 20th of August—the rent paid in advance will be refunded against reception of the "accommodation order," however, with a deduction of 10 kronen a head; should such notice arrive after the 20th of August, 20 kronen will be deducted per person.

Communications should be addressed to Central Ticket Office of the Hungarian State Railways.

Retrospect of Current Literature.

GYNÆCOLOGY.

UNDER THE CHARGE OF DRS. GARDNER, CHIPMAN, AND LOCKHART.

CANCER OF THE UTERUS.

NORRIS, C. C.—"Primary Cancer of the Fallopian Tube and the Report of a Case." *Surg., Gynæcology and Obstetrics,* March, 1909, p. 282.

The older writers denied the possibility of the occurrence of primary cancer of the Fallopian Tube, but about eighty-six cases have been recorded.

In the laboratory devoted to gynæcological pathology in the University of Pennsylvania, one case of primary cancer of the tube has been seen in comparison with ninety-four cases of uterine cancer. In the same institution eight cases of secondary involvement of the tube have been observed, five spreading from the ovary and three from the uterus.

Several histological varieties of this disease have been found to affect the tube, Jones having collected 40 cases of papillary cancer, 4 of medullary, 2 spheroidal called and 1 each of adenoma and alveolar, but these could have probably been classified under two heads, viz.:—alveolar and papillary, the latter being the more common. Frequently, however, both varieties are found to occur in the same specimen. A rare form, in which carcinoma originated in an embryonal rest, has been reported by Friedlander.

Macroscopically, the tube, before being opened, resembles that which is the seat of chronic inflammation and a diagnosis of hydrosalpinx may be made, Andrews reporting a case in which the tube contained two quarts of fluid. On splitting open the tube, difficulty in diagnosing malignant from benign papilloma will be experienced, but this may be cleared up by microscopical examination, but all tubal papillomata should be treated as if malignant. As a general rule the tube is filled with a soft, friable, brain-like material which is very vascular and bleeds easily. At times the uterine end of the tube is patent and particles of this tissue are to be found in the leucorrhœal discharge, which always ought to be examined under the microscope when cancer of the tube is suspected.

The disease may be bi-lateral but it is more common to find it confined to one side, the ratio being about 17 to 51.

It may originate in either a healthy tube or in one which has been the seat of a previous inflammation or a benign papilloma of the tube may take on malignancy, the latter being the more common mode of origin according to Doran. Pathologists agree, however, that inflammation is a strong predisposing cause and this view is supported by clinical evidence.

The age at which it occurs varies from 27 to 70 years, a large proportion being first seen about the time of the menopause. In Doran's series of 62 cases, only four were under 40 years of age.

The marital history is unimportant, many of the patients having given birth to several children, but the disease is preceded by a period of sterility, this being accounted for probably by the previous attack of inflammation.

There is no case on record where diagnosis was made before operation. This is partly due to the rarity of the disease and partly to the preceding inflammation masking the symptoms. The latter are a watery, sanious leucorrhœa or bleeding. Pain is variable both in occurrence and intensity, often being absent until the disease is far advanced. When present it is of a sharp, cutting character. The duration of the symptoms varies from a few weeks to several years, but the disease is said to spread more rapidly than when the uterus or ovaries are affected primarily, and metastases are seen earlier.

The mortality is very great. In 42 cases where the after history was obtainable, only two patients were alive at the end of three years.

YOUNG, ERNEST B. "A review of 254 Cases of Cancer of the Uterus from the Gynæcological Service of the Boston City Hospital." *Boston Medical and Surgical Journal,* February 25th, 1909, p. 225.

Out of 254 women with cancer of the uterus, only 19 cases of cervical and 9 of fundal cancer presented the slightest opportunity for a radical operation, and, on opening the abdomen, some of these were found to be beyond hope of cure. During the last 15 years there has been no gain in the percentage of cases favourable for operation, irrespective of the social position of the patients. In the early stages the diagnosis is difficult and the physician is not always responsible for the failure of the women to seek relief, but often this is due to imperfect examination of the pelvic organs by the medical attendant. Winter states that in Berlin 76 per cent. of women had consulted their own physician first and in two other clinics 72 per cent. and 50 per cent. had done so, yet in from 10 to 15 per cent. the physician had not made any examination of the pelvic organs.

By the education of the laity and medical men, the percentage of operable cases has been raised in Germany to 74 per cent., while in the United States it remains about 8 per cent., showing the necessity of conducting a crusade against this disease.

In the series under consideration, i.e. 254 cases, the cervix was attacked in 237 and the fundus in 17.

Cervical Cancer.—In 124 cases, histological examination adenocarcinoma in 4 and squamous in 121.

The negress was seen to be liable to the disease, out of 237 cases 8 being met with in coloured women. The age varies from 21 to 75, about 15 per cent. occurring between the ages of 35 and 50. The influence of childbirth upon the disease is marked. Kelly states that in only 3 per cent. of cases of cancer of the cervix is the woman a nullipara and his statement is borne out by other observers. As regards symptoms, hæmorrhage is the commonest to be met with in the early stages. Out of 224 cases, irregular bleeding was the first symptom in 129, an unusual vaginal discharge in 59, abdominal pain in 16 and simple increase in the menstrual flow in 14. One patient was induced to consult her doctor on account of increased frequency of miturition, while in another woman the first suspicion of anything being wrong was the discovery of a tumour in the vagina while attempting to take a douche. Cachexia is neither an early nor a constant symptom and is most commonly represented by anæmia and loss of strength.

Fundal Cancer.—Here the average age is 52 years, the limits being 25 to 72. In 16 cases, 9 or 56 per cent. had never been pregnant and one had merely had an early miscarriage.

The symptoms are similar to those in cervical cancer, but it is more chronic and the patient has a better chance for cure following operation.

Berkeley, Comyns. "Wertheim's Panhysterectomy for Cancer of the Cervix." *British Empire Journal,* March, 1909, p. 145.

The author defines the operation and then proceeds to discuss it from three standpoints, viz.:—(1) primary mortality, (2) percentage of operability and (3) percentage of ultimate cures.

The *primary mortality* is high but can be lowered by experience. In Wertheim's first 30 cases, this was 40 per cent., while in his last 30 it was but 7 per cent. Of 234 cases collected from British gynæcologists, the mortality was 18.1 per cent. The mortality following simple vaginal hysterectomy is considerably lower than this, being between 4 and 12.7 per cent. Every effort must be made to lower the operative mortality of Wertheim's operation, but, no matter how high the immediate mortality

is, if we have more patients alive at the end of five years by that method than by any other it is the one which we ought to select.

The percentage of operability in abdominal hysterectomy is higher than when the vaginal route is the one chosen because by the former method one can see better what is being done and can free the ureters better than by the lower route. Wertheim's percentage of operability is 49, Schindler's 46 and Bumm's 90, but the primary mortality of the latter is very high, viz: from 25 per cent. to 15 per cent.

The parametrium should be removed when practicable, Schauta finding it affected in 69 per cent. of his cases.

Wertheim has 138 women or 62 per cent. free from disease at the end of five years from the date of operation, this being a much better result than that following any other method of operating.

Complications.—The ureter is seldom involved in the disease as it has its own lymph supply, but it may be divided or ligatured or have its blood supply so interfered with as to cause necrosis with a resulting ureteral fistula. Such a fistula occurred in 24 out of Wertheim's 458 cases.

The bladder may be opened during the operation or necrosis of the wall be caused by interference with its blood supply due to ligation of the vaginal arteries or separation of the bladder from the vagina. Bumm had this complication occur five times in 108 cases.

The rectum is occasionally injured, Wertheim having one instance of this complication, a recto-vaginal fistula resulting.

Cystitis very commonly follows this operation on account of the proximity of the bladder wall to the large granulating cavity, and is one cause of the prolonged convalescence.

Another common complication is trouble with the abdominal wound. This either fails to heal by primary union or there is stitch abscess. Sloughing of the abdominal wound is most common where the discharge from the cancer is very malodorous and is due to infection.

The most common causes of death are shock and heart failure from the severity of the operation.

UTERINE FIBROIDS.

Scharleib, Mary. "Analysis of a second 100 Cases of Operation for Fibromyomata Uteri, with special reference to their degenerations and local complications." *Proc. of Royal Soc. of Med.*, 1908, Vol. II, No. 2.

Some form of degeneration was seen in nearly one quarter of the cases and, of these, eighteen directly threatened life without reference to

pressure or hæmorrhage. In some cases more than one variety of change is seen in the one specimen.

The degenerations were as follows:—

Œdematous or Myxomatous	4	cases.
Sarcomatous	1	"
Cystic or Fibrocystic	3	"
Calcareous	4	"
Necrotic Necrobiotic	6	"
" Infective	1	"
Sloughing	3	"
Adenomatous	1	"
	23	"

The complications were:—

Cysts or Cystomata of one or both Ovaries	20	cases.
Broad Ligament Cyst	1	"
Thrombi of veins or œdema of lower extremity before operation	2	"
Varicose veins of pelvis	2	"
Hydrosalpinx	1	"
Hæmatosalpinx	1	"
Pyosalpinx and Tubo-ovarian Abscess	3	"
Papillomata	4	"
Adhesions to viscera	12	"
Pregnancy	3	"
Inflammation of Appendix	4	"
Broad Ligament Fibroid	1	"
Ulcer of Rectum	1	"
Carcinomatous Invasion	2	"
	57	"

LIGAMENTOPEXY.

BARNSBY, H. "Remote Results of Abdominal Ligamentopexy in Mobile Retroversion of the Uterus in Young Women." *Revue de Chir.*, xxxviii, 1908, p. 631.

The author reported twenty cases of ligamentopexy, of whom six were virgins, nine nulliparæ and five multiparæ. Of these, fifteen were completely cured and the others so greatly benefited that they did not require further treatment. Of the nine multiparæ, five subsequently became pregnant and had normal pregnancies and deliveries.

VAGINITIS.

Boshower. "Infection Staphylococcique des Organes Génitaux." *Rev. de Gyn. et Chir. Abdominale,* September and October, 1908, p. 773.

While soiled clothes and unclean habits have long been known to cause vaginitis, it has only recently been proven that it can be caused by water containing micro-organisms. Van de Velde made cultures from nine cases of acute cervical metritis, associated with colpitis and vulvitis and found the same species of blastomycetes which he afterwards found in the water which had been used for douching.

Boshower relates a similar case in which a young lady had a discharge strongly resembling that seen in gonorrhœa. Bacteriological examination revealed the presence of Staph. Pyogenes Albus and water taken from the well used by this patient yielded the same micro-organism.

F. L.

OPHTHALMOLOGY.

UNDER THE CHARGE OF DRS. STIRLING, BYERS, MATHEWSON, McKEE, TOOKE.

"The Dependence of Ophthalmology upon other Branches of Medicine." Green. *Ophthalmology,* April, 1909.

Students of the literature of the past decade can hardly have failed to discern the development of a new tendency in ophthalmic thought—tendency which has sought to correlate the truths of ophthalmology with those of its sister branches of medicine.

Instead of fitting snugly into the great mosaic of the medical branches contiguous to neurology, internal medicine, rhinology, etc., it has shown an unfortunate exclusiveness, occupying a little space apart.

Many came to regard an eye as dentists regard a tooth—as being in the body, but not an integral part thereof.

Can we have a comprehensive understanding of the clinical and pathological aspects of ocular tuberculosis if we ignore the clinical and pathological aspects of tuberculosis in general?

The importance of exploring every avenue in the search for the exact diagnosis is now generally recognized.

Too long have we been content with such vague and unsatisfactory labels as rheumatic, gouty, anemic, idiopathic, etc., which we blithely affixed to every disease, the etiology of which was not perfectly obvious.

Accuracy in diagnosis is being attained not only by examination of the

organism as a whole, but frequently by the knowledge gained from the application of the newer diagnostic tests. The tuberculin reaction of Calmette and the cutaneous tuberculin vaccination of Von Pirquet, devised originally to facilitate the diagnosis of general tuberculosis, are finding an appropriate field in establishing as tubercular ocular conditions, obscure from the clinical stand point.

Ocular disorders in which neurologic consultation will often be advantageous and frequently indispensable include palsies of the ocular muscles, inequalities and abnormal reactions of the pupils, optic neuritis, and choked disk, certain types of retrobulbar neuritis, defects of the visual field suggestive of chiasmal or cortical lesion, and visual anomalies of an hysterical type.

The enlargement of the ophthalmic field of vision is nowhere more strikingly illustrated than in the present universal appreciation of the fact that various functional and organic diseases of the eye and its adnexa are due to diseases of the nasal cavity and its accessory sinuses.

The literature of the past ten years contains many allusions to the more or less intimate association of skin diseases with certain disorders of the anterior ocular segment. In searching for a possible cause for ocular diseases the oculist should ever bear in mind the possibility that pelvic disorders may furnish the clue to the problem in hand. As is well known normal menstruation may be accompanied by conjunctival congestion and purulent secretion. The connection between a gonorrhœal ophthalmia and a specific urethritis is too obvious to require comment. Writers have sought to establish a relationship between a gonorrhœa and iritis, but the relation of cause and effect is by no means entirely proved. Metastatic gonorrhœal inflammation of the conjunctiva and occasionally also of the lacrimal glands have been recorded.

The ocular complications of otitic disease are mainly those of muscular paralysis and optic neuritis.

The ophthalmic surgeon should not neglect to interrogate the condition of the mouth and teeth as it appears unquestioned that there exist definite causative relations between affections of the mouth and those of the eye.

"Snow Ophthalmia (Ophthalmia Nivalis)." GOUIN, *Annales d'Oculistique,* September, 1908. Review in Ophthalmology, April, 1909.

Gouin finds so-called snow blindness as observed by ophthalmologists, less frequent than is usually supposed. Guides and tourists have learned to provide themselves with protecting glasses and their eyes are not generally affected unless the difficulties of the route compel them to lay aside

the glasses, or they suppose they are not necessary in a misty atmosphere.

The supposed blindness that has been described is due chiefly to spasm of the lids, and when they are once opened, vision is found to be little or not at all diminished.

The visual field was affected in only two of the subjects examined.

The symptoms do not occur suddenly, most frequently in the night or awakening in the morning and consist of painful photophobia, redness and congestion of eyelids and conjunctiva, congestion of retina and contraction of the pupils.

The symptoms generally yield promptly to iced compresses, or hot stupes, protection from the light and applications of sulphate of zinc.

It is better to speak of snow ophthalmia as we do of electric ophthalmia. They are analogous not only in their symptoms, but in their causes, which in all probability is the action of violet and ultra-violet rays.

Urdmark showed that it is not the direct influence of the snow that produces snow ophthalmia, but rather light reflected by the snow, which is richer in ultra-violet rays than is direct sunlight.

This fact is confirmed by experience as a large proportion of reported cases of snow ophthalmia have occurred in cloudy weather or even at the time of a dense mist. The irritation of the external integument of the eye is not due, as was formerly thought, to reflex action from retinal excitation, but results from direct action of the injurious rays upon the eye lids, the conjunctiva, the cornea and iris.

M. K.

PATHOLOGY.

UNDER THE CHARGE OF DRS. ADAMI, KLOTZ, AND NICHOLLS.

THE YEAR'S PROGRESS IN BACTERIOLOGY—THE BACTERIOLOGY OF THE INFECTIVE DISEASES.

No attempt is made to indicate the advances in technique, because this is of interest more to the bacteriologist than to the physician. Some facts of general interest are here set forth:

Fevers.

Typhoid.—Mandelbaum (Münch. Med. Woch., LIV, Sept. 3, 1907), described a new organism from typhoid, which is designated a metatyphoid rather than a paratyphoid; it has the power of producing typi-

cal crystals underlying the colony in glycerine-gelatine, and appears to have no effect on hæmoglobin.

The ophthalmic test with a typhoid vaccine in the hands of F. L. Parker (J. Med. Res., XX, 1909), gave positive results in 70 cases tried. The reaction appeared in 6.8 hours and lasted 24. The stage of the disease at which the reaction was tried is not stated in the reference to which I have access. Braza confirms this.

Kraus, Lusenberg and Russ (Wien. Klin. Woch., Nov. 7, 1907), while finding the eye reaction positive, found that it was also positive in cases of pneumonia and multiple sclerosis. They went further, and using other emulsions found that paratyphoid emulsion gave positive reaction in 7 of 13 typhoids, that bacillus coli emulsion gave positive results in 11 of 11 typhoids, and that bacillus tuberculosis gave positive results in 11 out of 12 typhoids, which suggests that the ophthalmo-reaction is a little too anxious to please, and seems to lack specificity. A cutaneous reaction, similar to that of tuberculosis is reported by Link (Münch. Med. Woch., 1908), and others. Nakao Ate, being of a curious turn of mind, found typhoid bacilli in the lice on typhoid patients (Münch. Med. Woch., 1907).

One of the most interesting advances noted has been the discovery that patients may for years after the attack be carriers of the infection, either in the bowel or in other organs such as the gall-bladder. It seems to me probable that the idea is in danger of being exaggerated from a practical standpoint. Davies and Walker (Proc. Roy. Soc. of Med., April, 1908), say that 4 per cent. of cases become carriers for varying periods of time. A woman cook who had typhoid in 1901, in 1906 gave rise to 50 cases of the disease in three different institutions.

The effects of inoculation by typhoid vaccines may be here included. Leishmann (Jour. R. A. M. C., VIII, 1907), shows how he prepared his vaccine. Non-virulent cultures were grown in broth, killed by heat at 62°, and lysol was added; it was then standardized. In his subsequent communication, he indicates a useful modification, viz., that he killed the cultures at 53°. His second paper deals with results in garrisons of 12,083 men, of whom 5,473 were inoculated, 6,610 not so. In all 3.8 per cent. of inoculated and 28.3 per cent. of non-inoculated men got typhoid. Of the regiments where typhoid was occurring, 6.6 per cent. of inoculated men got the disease while 39.5 per cent. of non-inoculated men contracted it; with his later modification, *i.e.*, his new vaccine, 3.7 per cent. of inoculated men got typhoid as opposed to 32.8 per cent. of non-inoculated men. These figures cover a period of roughly a couple of years, and each man got two inoculations, first 500 million

bacteria, and later 1,000 million. This is the most striking series of figures I have seen in favor of the procedure.

Scarlet Fever.—No notable advance has been made. M. H. Gordon (Pract., Jan., 1909) found streptococci in all his cases, and divides them into two types. One found early on the tonsils of mild cases was identical with or closely allied to Klein's streptococcus scarlatinæ; this is known as streptococcus conglomeratus because it grows in clumps; he found it pleomorphic on solid media and at times bacillary in shape, even resembling in its irregularity the bacillus of diphtheria.

He did not find this form in the normal mouth, although the second type, streptococcus pyogenes is frequently found. The latter is more virulent for animals than the first described.

A. G. Banks examined the opsonic power, and found it greatly lowered in fatal cases; complications, he finds, constantly alter the power, and he was able to find no differences in opsonic power for typical and atypical forms.

In scarlet cases, a series observed by some one whose name I have omitted to note, showed no good results from heterologous polyvalent serum, where the organisms were killed by galactose.

Dealing with the serums of streptococci, Weaver and Tunnicliff (Jour. Inf. Dis., Dec. 18, 1908) killed the bacteria by suspending in 25 per cent. galactose; this gave protection when injected against the subsequent injection of homologous living organisms, which is not so when the germs in the vaccine have been killed by heat. Homologous streptococci are desirable for the production of this vaccine.

Diphtheria.—The main points of interest in this disease are that the bacteria have been found playing *rôles* which we consider usually as out of their province. Klimenko (Centr. f. Bakt., XLVI, 1908) isolated the bacillus from blood cultures taken in a mild case of the disease. Ucke (*Ibid.*, Mar. 10, 1908) did the same. Up to this time, so far as I know, the bacteria were supposed to remain entirely local.

Hammerschmidt (Zeit. f. Hyg., LIII, 1906) isolated it from pus in an abscess of the finger, where, however, it was associated with other organisms.

Günther (Centr. f. Bakt., XLIII, 1907) found isolated diphtheritic necroses of the intestine from which he isolated the bacillus and he reports a case of phiegmonous gastritis with the same finding.

In tests to distinguish B. diphtheriæ from the pseudo-diphtheria organisms, Zinsser of New York confirms Knapp's work, that in serum waters with the various carbohydrates, bac. Hofmann produces no

acid, bac. diphtheriæ ferments dextrine, not saccharose, while bac. xerosis ferments saccharose, not dextrine.

Glanders.—The ophthalmic and cutaneous reaction with mallein are being used for diagnostic purposes, but Putzeys and Stiennons (Ann. Med. Veter. Belgique, Nov., 1907), as a result of their work, think the reaction is not sufficiently exact for diagnostic purposes; Wladimiroff (Berl. tierärtz, Woch. Jan., 1908) came to the same general conclusion, but found that in cured cases, the positive reaction remained with these tests after it had been lost by the subcutaneous method. He thinks it is useful as a quick method to roughly separate sick from well horses in an outbreak of the disease.

Meningitis.—Conradi (Deuts. Med. Woch., July 9, 1908) details a method of finding the organisms. Centrifugate, heat at 60° 1—2 hours, place on gelatine at 40°, one part of the liquid to 3 of gelatine, pour in Petri plates, remove sediment from centrifuge tube and transfer by glass pipette to the plates; the organism grows as well as upon ascitic-fluid media.

Dopter and Raymond Koch (Comptes Rendus de Soc. Biol., LXV, 25th July, 1908), as a result of using the "anti-serum" of each to agglutinate the other found that the meningococcus fixes the agglutinines while the gonococcus does not; their conclusion from this is that the meningococcus and gonococcus are two specifically distinct organisms.

Pyocyaneus.—H. H. Waite sums up the case against this organism. It can cause fatal primary infection; its skin manifestations are probably but the local evidence of general infection; it is most commonly found in the middle ear and the intestine, and some cases of supposed typhoid without agglutination may be due to it. He reports two cases, one where it was the infection of a liver abscess, and one in which it caused purulent arthritis.

Whooping-Cough.—Bordet and Gengou (Annal. Inst. Past., XX, Sept., 1906) have grown the organism discovered by them in 1900 on glycerine media with potato and blood serum and finally on ascitic serum. Klimenko (Centr. f. Bakt., XLVI, Feb. 18, 1908) supports Bordet and Gengou against many other claimants, and has produced a raucous cough in apes by inoculating this organism in the respiratory tract. There has been a good deal of quarrelling over the priority of the discovery of this organism.

Friedländer's bacillus has been found in the urinary tract by Abel, Clairmont, Sachs and Wolf, independently.

Ferrarini has found bacillus subtilis in a chronic gland infection in which he considered it causative.

Rhinitis and Pharyngitis.—Allen (Lancet, Nov., 1908) classifies the "cold-producing" organisms as follows: (1) bac. influenzæ; (2) bac. septus; (3) B. Friedländer; (4) micrococcus catarrhalis; (5) microc. tetragenus, all of which may be present in a normal throat.

A chronic nasal catarrh, he says, is always the work of B. Friedländer; Eustachian tube catarrh often by mic. catarrhalis and chronic catarrhal tracheitis by mic. catarrhalis often combined with strepto- and other cocci.

Internal Structure of Bacteria.—Guilliermond (Arch. f. Protistenk, XII, 1908) has concluded after much work on the structure of endospore-forming bacilli that the bacillus has a diffuse chromatin system, without nucleus, that the nucleus that has been observed is probably a granule of volutine, or else the transverse wall which he has observed to form prior to division. The wall is made by the junction of two lateral masses of granulation, and splits at the time of fission.

J. McC.

THE YEAR'S ADVANCES IN IMMUNITY AND INFECTION.

In reviewing the study of bacteriology one is astounded at the development of this subject in the short time it has occupied a place in scientific medicine. The search for the causative agent of the nature of bacteria in disease has been incessant, and has not gone unrewarded. It would be quite out of place here to recount to you discovery after discovery of the infecting agent of many diseases,—and the process to-day still goes on although at a slower pace.

The empirical use of certain facts for the prevention of infectious disease led investigators into a new field, wholly unknown to bacteriologists. Experimental studies with bacteria, illustrating their action on animals, soon stimulated the enquiring minds to probe questions of individual, racial and species resistance. The finding of immune substances, so-called, in the blood serum and in various tissues threw a new light upon the whole subject of animal resistance, and also lured the way into the darkest marshes of sciences from which only the most imaginative and creative minds have emerged.

He who hopes to gain even an insight into the maze of immunity problems must be prepared to enter upon a long term of grind, and bury himself amidst untold stacks of literature. It is almost impossible to gain a proper conception of the later day discoveries in immunity without first having some knowledge of the historical development of the subject.

There is generally a false conception abroad that the researches in

bacteriology and the studies in immunity have been concerned only within the field of medicine. One must appreciate that the investigators in these subjects have striven in an entirely new and dark field of research and were ever at a loss to know where their investigations would lead them. It has thus come that there has been a vast accumulation of records of most diverse kind, and of many of them we ask the question, "To what purpose?" Save for the single instance of antitoxin in diphtheria but little use has been made of the studies of immunity in a therapeutic way. True we must admit that the results obtained by applying the knowledge acquired in respect to tetanus, epidemic cerebrospinal meningitis and typhoid are fairly satisfactory. There has also been a host of studies on serum reactions in infectious diseases which have in some measure served a good purpose in diagnoses. Yet, with all the facts that have been accumulated concerning hæmolysins, bacteriolysins, amboceptors, complements, antiamboceptors, opsonins, aggressins and anti-ferments, what practical purpose do they serve? In many cases it would seem that it has been but the counting of the grains of sand by the sea, accumulating facts which but serve as a monument of misspent energy.

I do not wish to appear as a severe critic, or to discourage the efforts which may yet lead to new discoveries. One cannot foretell what good results may evolve from scientific research when honestly performed, but it does seem too bad that our medical science must become embarrassed by the weight of the accumulating literature from the laboratories. Nevertheless, it seems that this must be, and the records of the successes and failures of the investigators must be preserved for the guidance of others.

Of all the results obtained in the study of immunity, it is painful to record that concerning the earliest discovery of the protection of man against disease, we have not advanced one step beyond that set forth by the discoverer of vaccination, as it was given by Jenner in 1796, nor have we any further information on the subject of the protection against rabies, as the original investigator, Pasteur, gave it to us. Of diseases like typhoid, dysentery and cholera, when they have already manifested themselves, we are at a loss to know whether the methods of attack should be along antitoxic, bacteriolytic or some other means yet undiscovered.

There seems little wonder, therefore, that with our ignorance of the nature of certain infections, while, on the other hand, with the accumulation of so many facts of minor importance, confusion reigns in the studies of immunity.

However, of late, some light has been thrown on the subject of bac-

teriology by those (Bail, Weil, Wolf and others) probing into the fundamental principles of infection. This study becomes essentially a biological one, and a clear grasp must be obtained of the mode in which bacteria gain access to the body and the reasons for their continuous propagation within the host. The results which follow upon the bacterial invasion either from the side of the bacteria or from the side of the host is a subject which is entirely secondary to it. The studies in immunity must for the moment cease and useless theories of their action must be withheld only to fall in line after the biological problems of symbiosis and infection are cleared up.

We are not infrequently confronted with the fact that a certain organism has become an invader of animal fluids and tissues, and has lived in perfect harmony with the host, without in the least giving annoyance to the carrier. In proof of this we recall the presence of bacteria in the intra-abdominal tissues (Adami, Nicholls and Ford). It is evident that a biological relationship may exist between bacteria and the tissues of the higher animals,—in other words that symbiosis may exist. In the bacterial or protozooal world symbiosis is more common or even essential in their life. Amœba of dysentery you will remember can be well cultivated outside of the body if it is associated with the vibrio of cholera, or the B. coli; on the other hand, pure cultures of the amœba are difficult to obtain, although this parasite may live in pure culture in the animal tissues.

What then are to be considered as infections? The dividing line, separating infections from symbiosis, is a narrow one. This becomes more particularly true of those organisms which during their usual life had a saprophytic existence,—that is outside of the living body, but which may at any time take on parasitic qualities and invade the tissues of animals. There are some organisms which under no conditions become parasites and hence are harmless. Others again, like the B. subtilis, are under ordinary circumstances saprophytes, but when forced or placed under the proper conditions can take on parasitic qualities and infect living animals.

The common organisms which we meet with in medical and surgical infections are spoken of as half parasites, that is, that the organisms can lead equally well a parasitic or saprophytic existence. Examples of these organisms are the B. typhi, B. coli, B. dysentery, V. cholera, the streptococci, staphylococci and many others. This class forms by far the largest of those bacteria which concern us.

There is a small class of strict parasites. Such organisms can live and propagate only in association with the living cells of the animal

body. This class of strict parasites is being constantly reduced as the technique in bacteriology is becoming improved, and the time will yet come when almost all, if not all, the bacterial organisms will be transferred and propagated on artificial media. The various spirochætes and the fusiform organisms refuse to grow on artificial media.

In the consideration of an infection we must consider the two factors which come into play. Firstly, on the part of the animal to be infected, what powers of resistance does it possess, and how can it combat the entrance of bacteria into its tissues? It may be briefly stated that these resisting powers are given to the serum in the nature of alexins and bacteriolysins; to the leucocytes and tissue cells in the shape of phagocytosis, and to the combined action of the serum, containing its opsonins, with the leucocytes. With such portentous resisting powers it is remarkable that bacteria can gain a foothold. On the other hand the bacteria possess a power to break down the resisting forces of the host. This forms the true aggressive nature of the organism, and upon the aggressive power depends the virulence of the bacterium. Hence whether bacteria gain a foothold in the body or no, depends directly upon the relative amounts of aggressions produced by the bacterium to the amount of protective substances present in the animal body.

Bail has shown that the aggressins, which inhibit phagocytosis and bacteriolysis can be isolated in a free state. These aggressins are secreted by the bacteria, and are in themselves harmless. When aggressins are obtained and inoculated into an animal, no toxic action is evident; but when a proper dose of aggressin is inoculated with a sublethal number of bacteria, death results. Here inhibition of the protective forces of the body has allowed the invasion and growth of the bacteria to go on unhindered.

It seems apparent also from Bail's experiments that the bacteria can increase their powers of producing aggressins very much. It is the common observation that old laboratory stock cultures, which have been propagated on artificial culture media, are poor invaders of the animal tissues as compared with the bacteria obtained directly from another infected animal. This invasive power appears to be dependent upon the production of the aggressins.

These aggressins are substances quite apart from the actual poisonous substances produced by the different bacteria, and with it an immunized animal may be rendered so sensitive to the invasion of the particular infection to allow an otherwise harmless inoculation to be fatal. In considering the outcome of this infection alone, we would probably assume that there had been an alteration of the virulence.

It is difficult to obtain a true grasp of the word "virulence" when applied to bacteria, for when applied to the tetanus bacillus it has quite a different meaning to that implied when associated with the anthrax organism.

It will become necessary to study each micro-organism for its power to produce aggressins, and also for its toxin producing capabilities. It too will probably become necessary to direct our attention towards producing an immunity not only against the poisonous products of the bacteria, but also against their aggressive powers which allows them to invade the body.

Some years ago we spoke in a general way of the natural resistances which the animal body possesses against bacterial invasion. As the studies concerning this process progressed, it was soon shown that the resistance varied with each species of animal, and that bacteria, which in the smallest doses produced death in a certain species, was harmless for another. This variation in the resistance becomes more evident the farther apart these species stand in the animal world. Examples of absolute immunity to known pathogenic organisms are not frequent, save in cold blooded animals towards infection of the warm blooded species. Nevertheless, we find that the dog and rat possess a great resistance against anthrax, while it is only with difficulty that the guinea-pig is infected with chicken cholera.

Observations were soon forthcoming that the animal resistance was due to germicidal substances in the blood. Landau, Grohmann and others observed that shed blood had a detrimental action on bacteria, but Nuttall was the first to bring forward accurate evidence of these bactericidal substances in the defibrinated blood fluid. He found that when bacteria were exposed to the action of blood serum, they were quickly destroyed, and he also noted that when this serum was heated to 55°C. it lost its bactericidal powers.

The further work on this natural immune substance present in the serum was carried on by Buchner and his pupils. This natural immune substance he called alexin. These alexins destroy the bacteria without the intervention of the leucocytes. Although alexins are destroyed at 55°C., freezing has no effect upon them.

Buchner was of the opinion that alexins were identical with the proteolytic enzymes derived from leucocytes. This view has been in part supported by Metchnikoff, but up to the present the question remains undecided. That the alexins are of proteid nature is evident from the nature of their action and their physical properties. Others (Baumgarten, Jetter, Fischer and others), believe that there were other organic

and inorganic substances in the serum, which in themselves were bactericidal.

That there is, however, a relationship between the bactericidal action of cell-free serum and the leucocytes seems apparent. Though this was inferred by Buchner, the first experimental proof was brought forward by Hankin and Kanthack. They regarded the granules of the amphophile leucocytes as the mother substance of alexin. By experimental means they were able to increase the numbers of these leucocytes in the blood and found that the bactericidal substance was also increased. Observations are also forthcoming to show that the leucocytes during life secrete these substances into the serum, and others have shown that bactericidal products are liberated with the death of these leucocytes. Van der Velde was able to extract alexins from leucocytes in distilled water.

Schattenfroh was, however, of the opinion that alexins differed from the bactericidal substances, which were extracted from the leucocytes. These differences were noted mainly in that the former were destroyed at 55°C., while the latter were not affected until a temperature of 80°C. was reached. Much work has followed these observations to prove the identity or the individuality of alexins and the bactericidal substances of leucocytes.

It has been found that the alexin content of the serum varies considerably in each individual. The influence of heat and cold, diet and starvation and of shock, leads to an alteration of the alexin content. Likewise certain nervous conditions are found to reduce the normal resisting powers of an individual.

Not alone do we possess substances which will resist bacterial invasion in the blood and in the tissue juices, but the cells of the body take an active part in opposing foreign invaders. We are familiar with the fundamental principles underlying Metchnikoff's process of phagocytosis. He laid much stress upon the germicidal powers of the wandering blood cells and attributed to them the greatest power in overcoming infections. He was of the opinion that such antibacterial substances which were found in the blood fluid were derived from the leucocytes either by secretion or in their process of decay.

To-day we can extend the theory of phagocytosis to a much wider range of cells other than leucocytes, for it is found that the same process of digesting bacteria can take place within endothelial, connective tissue and liver cells, and it has even been asserted that the nerve cells have a phagocytic property.

It is difficult to state what actually takes place within the cell during the digestion of the bacteria. That the bacteria are destroyed by a fer-

ment action is more than probable, for it has been possible to obtain such a ferment from the leucocytes. In some instances this ferment acts best in an acid medium.

It is impossible to go into Metchnikoff's ideas regarding phagocytosis; suffice it to say that he believes that the humoral and cellular immunity are very closely associated, in short, that the humoral immunity is the process of cell resistance in another form.

The very important role, however, which phagocytosis plays in infectious diseases has been demonstrated by Wright and also Neufeld. Both of these authors have demonstrated that the leucocytes are very active factors in overcoming infection. Wright has devised a technique by which he could estimate the fighting powers of the leucocytes and determine the actual part these cells played in overcoming a given infection. There has been much controversy regarding Wright's work, much of which has resulted from the failure in mastering his difficult technique. Quite recently Meakins has pointed out some fallacies arising from Wright's method of determining the opsonic index. These fallacies, according to Meakins, are very important, and throw some doubt upon the conclusions which Wright and others have drawn from their own figures. Wright in his work has made the dilutions of the serum to be tested in only one liter, 1 in 3. Meakins has shown that whereas with normal serum this dilution gives the highest count of bacteria per cell, and that on further diluting this normal serum, the phagocytic index decreases, the index of a patient's blood need not follow this course. He has observed in typhoid fever that when a dilution of 1 in 3 was used, the opsonic index was below normal, whereas when a dilution of 1 in 30, or 1 in 200 was made, that the opsonic index was much above normal. This important discovery requires serious consideration before conclusions can be drawn as to the phagocytic value of a patient's leucocytes and serum.

In general, we might say that of the protective forces which we naturally possess, they have little influence upon the toxic substances secreted or contained within the bacteria, and almost all of our natural powers of resistance are directed against the life of the micro-organism. Induced immunity is, however, quite another thing, for with it we are able to develop anti-substances to the bacterial toxins, and thus gain true antitoxins. This process of developing antitoxins and inducing bacteriolytic sera is so familiar to all that we shall not take up your time with a repetition of it.

Let us turn for a moment from the consideration of the nature of infections to the more recent studies upon hypersensitiveness and hypersusceptibility. Some time ago we discussed the report of Pirquet and

Schick on serumsickness, and of Rosenau and Anderson on anaphylaxis.

The earlier explanation which was offered for serum anaphylaxis, that it was the result of autogenic immune bodies liberating bacterial or albuminous toxins (Wolf-Eisner, Nicholle), did not receive many supporters. Nor did the explanation, that the introduced antigens removed from the body too much of the complement, offer a solution of the problem (Bail). Greater support was given to the view that the overproduction of antibodies caused too great a loss of tissue substance (Friedemann).

Wolf believes that the antibodies developed in the body, act by liberating or decomposing the introduced proteid body, and in this way set free a toxin. In this his views coincide with those of Vaughan and Adami.

We are familiar with the fact that we can cause an animal to become hypersensitive to certain proteids and albuminous fluids, and that this hypersensitiveness is evinced by certain manifestations of symptoms. We are also familiar with the hypersusceptibility which can be developed towards tuberculin, and that the manifestations of this are quite different from those of serumsickness. This difference becomes still more evident since it has been shown that the hypersusceptibility to proteids can be passively transferred to other animals. Gay believes that such a transference is only the result of carrying over poisonous antigens. Along these lines we have commonly explained the increased susceptibility of individuals to the tuberculin reaction, observing that there was a transmission of a lowered vitality or a decreased resisting power. The tuberculin reaction could also be explained by a supposed almost equal balance of the immune bodies and the antigens in the tuberculous subject, while then the inoculation of tuberculin would lead to a general toxic reaction to it.

Koch explained the localized reaction of tuberculin in a tuberculous patient to the summation of the poisonous action of the introduced tuberculin along with that gained from the tuberculous tissues. Wassermann on the other hand believes that the reaction is due to the localized accumulation of immune receptors acting as noxophiles. In other words, Wasserman considers the immune bodies as the agent causing the reaction. According to this latter view the process is not a harmful one but a reaction partly physiological, linked with the local production of antibodies which make the local area one for greater reaction with the noxa; that is an increased susceptibility.

By introducing tuberculin into a tuberculous subject, this tuberculin is attracted to the areas where the anti-tuberculin receptors are being

produced, that is in the areas about the tuberculous foci. It is here that the reactions take place, and where the manifestation of symptoms occur. On the other hand, in respect to anaphylaxis, some differences from the tuberculin reaction assert themselves. It is found that by sensitizing with albuminous or bacterial bodies, toxins and other substances, it is possible to transfer this anaphylactic condition like other types of immunity from one animal to another by the serum.

This gives some clue or rather an explanation for the reaction of anaphylaxis. It is probable that the small sensitizing dose, which is first administered, or which has naturally found its way into the body, has stimulated the production of certain specific receptors, which, however, have not left the cell. In this, the reaction differs from that of immunization, in that the receptors are not forced into the fluids or serum. The increased number of receptors makes the cell more susceptible and a locus minoris resistentiæ for a further dose of the same noxa.

Rosenau and Anderson have recently contributed some further information on anaphylaxis. They have found that guinea-pigs can be sensitized in seven days when the first injection of serum is made into the brain, while by the subcutaneous method the animals are not sensitized before nine days.

It was also found that when the serum used for sensitizing was heated to 100°C. for an hour, it lost nearly all its power of producing the hypersusceptibility of the animal. The brain or serum of a sensitized animal has, however, no power of absorbing the sensitizing product from the test serum. The longest time which has elapsed between the sensitizing dose and the one producing symptoms in guinea-pigs was two years and two days. It seems, therefore, than when guinea-pigs are once sensitized, they remain so for life.

It was held by Besredka that the toxicity of the serum injected was inversely proportional to the age of the serum. Rosenau and Anderson could find no such relationship, nor were they able to inhibit the anaphylactic state by treating the animals with chemicals. Besredka believed that different sera varied in their toxicity, and thought that the sera to be used for therapeutic purposes should be tested on guinea-pigs previous to the administration in man. Rosenau and Anderson cannot agree with these statements, and believe that the sera do not vary so much in their toxicity, as does the susceptibility of different individuals.

There is ample proof that the anaphylactin or sensitizing substance is specific for each form of proteid, and it is possible to sensitize an animal against several proteids at the same time. Such animals which are sensitized against different proteids will react for each substance

separately. It is pointed out that human milk and cows' milk develop a special anaphylactin for each, and like the anaphylactin of proteids these substances will sensitize a second animal when the serum containing them is inoculated into it.

In 1907, Gay and Southard described what they considered to be characteristic lesions in animals dying from serum sickness. They found localized hæmorrhages in various organs, and, more particularly, the stomach. Rosenau and Anderson have failed to confirm these observations, and do not hold the lesions described as being typical for the disease. The most constant finding was a dilatation of the small veins and capillaries. The focal fatty changes and the fatty degeneration of the endothelium were not found, as described by Gay and Southard.

An interesting suggestion is made to explain the toxæmias of pregnancy on the lines of anaphylaxis. Rosenau and Anderson showed that the blood of the fœtus does not sensitize the mother, nor can the severe symptoms of toxæmia be due to the passage of fœtal blood into the mother. They have found, however, that the mother can be sensitized by injecting a small amount of placental extract and later giving a second injection of the same. Animals so treated show severe symptoms of anaphylaxis. Although only few experiments have been carried out, the authors suggest that there may be a relation between cases of puerperal eclampsia and the phenomenon seen in the guinea-pigs.

O. K.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The twelfth regular meeting of the Society was held Friday evening, March 19th, 1909, Dr. J. A. Hutchison, President, in the chair.

METATARSALGIA.

A. MacKenzie Forbes, M.D., showed a living case presenting this condition.

LANTERN SLIDE SHOWING BONY UNION AFTER ARTHRODESIS.

G. P. Girdwood, M.D. This case of arthrodesis was one belonging to Dr. MacKenzie Forbes, I merely prepared the skiagrams taken before and after the operation.

A. MacKenzie Forbes, M.D. This case is presented here tonight merely to show that bony union can take place in these cases though so much is held to the contrary. I think the skiagram shows this very well. The case was of a child 5 or 6 years of age.

THE EFFECTS OF METATARSALGIA.

A. MacKenzie Forbes, M.D. The report of this case appears in the April number of the Journal.

THE THYROID.

F. J. Shepherd, M.D., gave the paper of the evening which was illustrated by many lantern slides. Dr. Shepherd took up every phase of this subject.

H. S. Birkett, M.D. I think we must express our appreciation, not only of the work which Dr. Shepherd has presented to us this evening, but also of the excellent results which he has obtained. The subject of the thyroid gland has interested me for a good many years, largely from the pressure symptoms as frequently exemplified in the larynx and trachea. I am very glad to hear that Dr. Shepherd has emphasized a very important matter in connection with examination of the larynx before operation as to the mobility of the vocal cord. One case in particular he mentioned in which this had not been done, with the result that the injury to the recurrent nerve on the opposite side led to such urgent spasm as to necessitate tracheotomy, a subsequent careful examination showed a long-standing paralysis of the vocal cord on the opposite side. Further, the recent work of Killian and Jackson serves to show the importance of examination by means of the bronchoscope

to determine the exact site of pressure upon the trachea, which, in many cases, are not made out by means of the laryngoscope when pressure is exerted on more than one place.

J. G. Adami, M.D. With Dr. Birkett I feel that this occasion should not pass without expressing our gratitude for this evening's paper. Through Dr. Shepherd's work and through the frequency of goitre on the Island, Montreal has become one of the great centres for operation on the thyroid. We in Montreal feel that the work that is done here on this condition is second to none. I was extremely interested to hear from Dr. Shepherd that he has now given up very largely this process of enucleation of thyroid cysts and that because, while as Dr. Shepherd says, there is here the formation of a cyst wall and it is possible to enucleate, yet from the nature of the development of these thyroid cysts the cyst wall is a false one, that is to say, thyroid tissue may be recognized lying within the cyst; the wall, as shown in Dr. Bradley's studies, is merely condensed thyroid stroma; in fact there is really no sharp line of demarcation, even in those cases that are calcareous. It has always seemed to me that there was this danger, that these cannot be enucleated with the same sureness as a hydatid cyst or an ovarian dermoid can be enucleated. Another point is Dr. Shepherd's very positive statement that he has on several occasions removed the whole thyroid without any absolute harm. This is rather a moot point, and I would like to ask Dr. Shepherd if he believes that in these cases he has got the whole gland out, or are there any accessory glands away from the site which may have been left in. With regard to the malignant thyroid, there is a good deal of interest now being shown in regard to the sites of the secondary development; I would ask Dr. Shepherd what his experience is as regards recurrence in bone, such as has been described by not a few authors.

F. J. Shepherd, M.D. I wish to thank you very much for the attention you have given me this evening. It is a subject in which I have been very much interested. With regard to the complete extirpation of the gland I think that I took everything away, and if the parathyroids were in their ordinary position they certainly went with the mass. In at least ten cases I removed the whole thyroid and no bad results occurred. I have never seen a case of tetany, and I have operated on 200 cases, and only one case of myxœdema developed and that was in a malignant case. As to cancer of bone in malignant cases, I have never seen it; it seems to have been all in the lung, as evidenced by the spitting up of blood, etc.

CASE OF DIABETES MELLITUS.

W. F. Hamilton, M.D. The report of this case will be found in a later issue of the Journal.

JOHN MCCRAE, M.D. With regard to the alkaline treatment, once in the Johns Hopkins Hospital, I had in the wards a boy of 14 who had been a diabetic for some considerable period. At this time he developed acetone in the urine, became rapidly drowsy and passed into coma. With 36 hours of the alkaline treatment, he came back to what was his normal state in the hospital. The amount of alkaline was a drachm of soda bicarb. by the mouth as frequently as he could take it without vomiting. We also gave him enemata of 400-500 cc. water in each of which was 1-1½ oz. soda bicarb. and in addition to that we gave him strong subcutaneous injections under the pectoral muscles.

PLEURISY: SOME AUTOPSY STATISTICS.

A. R. LANDRY, M.D. This paper appears in the April number of the JOURNAL.

J. G. ADAMI, M.D. No one would imagine that this paper represents a year's hard work, and that late into the night. And yet there is here a larger mass of material upon pleural adhesions than has ever been brought up before, the next largest I think is some 300 cases. I do not hesitate to say that these results regarding the relationship between grave and recognisable tuberculosis, and the obsolete, or even of the acute type in the body and of these pleural adhesions are of very great value. There is a certain order of statistics here that one is not able to find in books. Of course there is the one weak point in post mortem work, namely, that tuberculosis may have been present and may have been absorbed. One cannot make the statement, for instance, when he finds old adhesions without tuberculosis in the body that there never has been tuberculosis. Nevertheless, I find on looking over our statistics at the Royal Victoria Hospital that, roughly, 50 per cent. of cases coming to autopsy present definite recognisable tuberculosis. And yet we here in Canada are not so badly off, we do not have that huge proportion of cases that are recognised in Germany and in industrial districts in the old world. One point I think one may lay stress upon in this paper, namely, that our autopsies are thorough and the routine examination represents very thorough search for evidence of tuberculosis, and that so the figures may be trusted. I hope that these results will be of some value to the clinician as emphasizing the great frequency of pleural adhesions, and secondly the infrequency with which they are recognised. It may be news to many here that 7 out of 10 of the people of Montreal have suffered from old active pleurisy.

W. F. HAMILTON, M.D. Our case reports are not all written for statistics, perhaps it would be well if they were so written. Questioned

upon the matter of thoracic pain and this symptom and that symptom, of which, perhaps, the patient has no experience during the past 30 or 40 years, granted that these patients were exceptionally intelligent, I think it would be difficult to find clinical evidence for underlying lesions. As to the clinical features at the time I think the clinician may be excused for having overlooked such things. Doubtless they were for the most part absent. I think we should encourage our young men in such work as Dr. Landry has brought forward tonight.

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A LECTURE ON LIFE.[1]

BY
J. G. ADAMI, M.D.

To all of us mortals presents itself the question, why are we?—what is the meaning of this state of living?—what is life?—to none more often than to the physician. His duty it is to tend the lamp of life. Time and again, as day follows after day, he sees it burning low; now in danger of being blown out rudely by some all-unexpected gust; now guttering down with weak and weaker flame, flaring up momentarily, but it may be only momentarily, until the cold blue flame, scarce giving light, ushers in the darkness of death. His duty it is to keep the lamp alight and burning brightly as long as possible—to prevent that darkness. Is it surprising that he asks himself, again and again, what is life?—what is this flame to which we minister?

Think of it! Think of the countless ages—for we cannot count them—since man first became capable of abstract thought, and so became truly man! Think of the generations that have come to life, have grown up, and had their day, and passed! To each in turn this question has presented itself—to each. And direct answer has been found by none of all of them. And the generations have consoled themselves by the thought that this infinite mystery of existence, abysmal, dark, is purposeful; that it is the God who has created life, that He knows, and that suffices; He knows and we, His creatures, cannot attain unto His knowledge. The generations have had those of robust mind, those whom this philosophy did not wholly satisfy, those who have asked why this should be. Solomon has succeeded Job, Goethe has followed Kit Marlowe, the author of the "City of Dreadful Night" has followed the author of the "Rubaiyat," and Herbert Spencer, Lucretius; but no one has lifted the veil.

To-night I wish to range myself anew among the enquirers. I would not say we can lift the veil, for in such inquiries, as in all other investi-

[1] Delivered before the McGill Medical Students' Society in 1905, and redelivered by request and with additions before the Ottawa Valley McGill Graduates' Association in March, 1909.

gations into nature, we can reach but to a certain point. It seems to me, however, that it is possible to penetrate further into the mystery now than ever in the past ages. I hold it right also that, being endowed with minds, we should strive to understand all that we can regarding that which is of so deep importance. All the same, it is with no little hesitation that I have determined to make this the subject of my talk to you this evening, and that because, however much we may desire to treat purely the scientific aspect of the subject, religion and the views we have imbibed from earliest childhood inevitably obtrude. It is not given to the majority, as it was to Darwin and to Pasteur, to separate in all humility their scientific from their religious lives and thoughts.

I can recall an open air *déjeuner à la fourchette* in a little Parisian courtyard over on the *'rive gauche,'* the sun glinting through the trees upon the napery and glassware of the table: a luncheon with Emile Roux, the great pupil of the great master. The conversation had turned upon Pasteur and his modes of work and habits of thought. That happened close upon a score of years ago, but I remember it as though it were yesterday. And Roux then traced what long years of intimate fellowship had taught him were the mainsprings of the great master's activities. He spoke of his sincerity, his earnestness, the deep-seated religiousness of his character, his attachment to the Church, and the beautiful faith which dominated the family life. It was a revelation to me, and I said as much. "No," said Roux, "M. Pasteur never alludes to these matters in his writings. He holds firmly that a man's faith and his knowledge of science are two wholly different parts of his existence which it is presumption on his part to try to harmonise. Humbly, and not with pride should we regard our scientific knowledge and acumen. The facts we have garnered are few compared with the vast bulk of hidden knowledge; the deductions we draw from those facts are at the most to be treated as working hypotheses, liable to be modified by further accumulation of facts."

We are, to paraphrase Roux's words and employ Carlyle's simile, but sticklebacks in a puddle. What can the stickleback in his insignificant pool know of the workings of the great universe? Faith is essential to, and inherent in our human nature: it depends upon, and grows upon that which is not demonstrable: the realm of the spirit is apart from the realm of science. To presume therefore, with this imperfect knowledge, to test and criticise revealed religion, or upon it to build up our faith is absurd. Keep therefore the two apart; strive ever to gain a deeper insight into the truths of the natural world, and at the same time, nourish what is spiritual within us: but do not waste time and energy in attempt-

ing to harmonize things which can only be harmonized when all is open and all is known.

Now I am convinced that in this attitude of Pasteur there is a profound truth. The blatant infidelity of the present day is, it seems to me, founded upon this futile attempt—and inevitable failure— to harmonize knowledge and faith—things which to-day cannot be discussed the one in terms of the other. Whether the attempt be made by those deeply religious, or the reverse, the result is almost equally disastrous. At the most I would say that the studies of the individual worker upon nature and natural phenomena must inevitably influence the life, and through the life, the faith also of that individual. This, however, is one thing. To go into the market-place—or magazine—and discourse dogmatically concerning these matters is quite another.

Few, however, have attained unto this philosophy, sound though it be, and thus it is with some temerity that to-night I take up this discussion of life. Too few realise that religion is assuredly not based on matter, or to put it in another form, that all things have their spiritual as well as their material aspect. Let me impress upon you that I have to deal with the material aspect of life only, and that doing so, while acknowledging its existence, I do not venture to discuss the spiritual aspect: that thus I do not come before you as a materialist, and if to some who have not reached thus far, if to those who cannot dissociate the spiritual from the material in living matter, it may seem almost impious to probe into the constitution of living matter, let me reassure them. In the old days it was accounted to Galileo as an offence against religion that he should demonstrate that the earth was not the centre of the universe; that the sun did not travel round it, but it round the sun. We all now accept Galileo's teaching, and our religion is in no whit weakened thereby. Less than a century ago our forefathers regarded as heretics those geologists who taught that fossils were the remains of living beings, and that therefore the earth's age, instead of being an odd six thousand years, as Archbishop Ussher and others had computed, must be some hundreds of thousands of years, if not millions. Everyone now-a-days accepts the geologist's evidence without thereby being accounted an enemy of revealed religion. Fear not, therefore. True religion is unaffected by results of research upon natural phenomena.

So now to come to my subject—What is life? This in the first place is to be noted, that if we analyse what we recognize as living matter, or more accurately, matter that had been endowed with life, whether we take the most minute vegetable or the largest animal—from one end of the scale to the other—from the simplest to the most complex, we gain

one particular order of substances as the result of our analysis—an order only found in nature in connection with matter that has been living—and these substances we speak of as proteids, or proteins. Save for water and certain very simple salts of sodium and potassium, these proteins are the only bodies common to all forms of matter that have been endowed with life. There are plenty of other substances which we may gain from certain orders of living matter—chlorophyll, starches, fats, and so on, but these are not universally distributed. The proteins are the one order of substances derivable from all animate bodies. We may express this in another way by saying that life is immediately associated with the presence of proteins. This, however, is not absolutely correct; we are not convinced that the proteins as such are actually present in living matter—in fact when we isolate these proteins they do not exhibit the properties which we associate with life: they cannot move, they cannot grow, they are insensitive to stimuli. We only know that dead organic matter yields proteins. It is more correct to say that life is associated with the presence of *proteidogenous* matter—of matter which in dying, as again in certain of its activities while living, yields proteins.

But so universal, so essential is this association, that clearly the first step to a comprehension of living matter must be gained through a study of these proteins and their properties, or to repeat, the phenomena of living are clearly bound up with the processes of association and dissociation of bodies of this particular order. For more than fifty years the physiological chemists have been working at the problem of the constitution of these proteins. At first the problem seemed hopeless. It was found that they were formed of carbon, hydrogen, oxygen, nitrogen, sulphur, but the formula of constitution was something appalling. Common salt, Na. Cl., for example, consists of one atom of chlorine (Cl.) joined to one atom of sodium (Na.). But in these proteins the amount of sulphur to be obtained is so minute compared with amount of the other constituents that obviously the molecules are of enormous size. Take, for example, one of the proteins which since it can be obtained in a crystalline form, must be regarded as among the less complex, namely hemoglobin, the protein which gives the red colour to the corpuscles of the blood. Its molecular composition is somewhere in the neighbourhood of

$$712^{1} \quad 1130^{2} \quad 214^{3} \quad 245^{4} \quad 1^{5} \quad 2^{6}$$

The molecular weight of water, formed of two parts of hydrogen to one of oxygen, is 16, the average molecular weight of the proteins has been

[1] Carbon. [2] Hydrogen. [3] Nitrogen. [4] Oxygen. [5] Iron. [6] Sulphur.

estimated at 15,000, or, otherwise, this molecule is about 1,000 times as weighty as is the molecule of water. I say in the neighbourhood of these figures, for no two samples yield identically the same results. It seemed impossible to think of building up experimentally such hugely complex bodies.

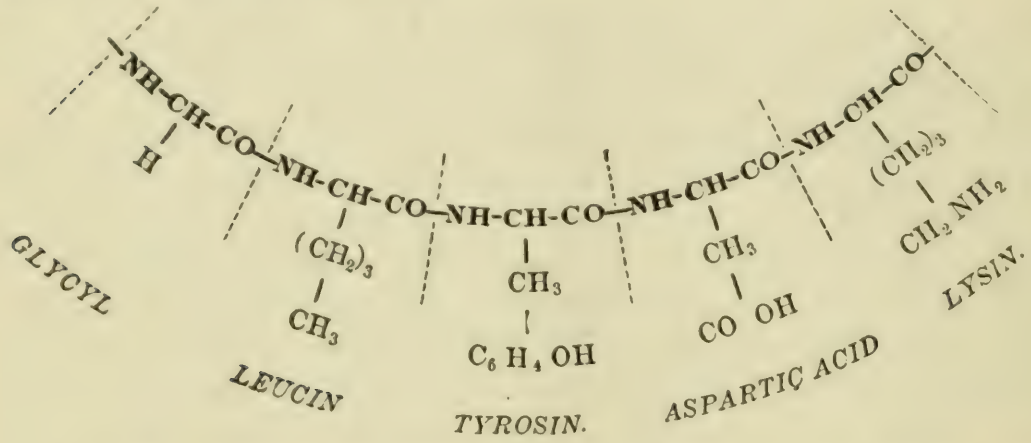
Next it was found that these molecules are, as I may express it, conglomerates. Hemoglobin, for example, can be split up into an iron containing protein, hæmatin, and an iron-free, globulin; and in the Seventies and Eighties a material advance was made in the study of the products of splitting up the molecules by the action of acids and of the digestive ferments. The peptones and albumoses so obtained were found to be less complex. In the Nineties Kossel discovered a group of proteins, the simplest so far obtained—namely the protones—bodies allied to the peptones, whose molecules are much simpler. Thus Sturin obtained from the sturgeon is

C	H	N	O
36	69	19	7

Only yesterday my colleague Professor Ruttan showed me a fat formed from the hydrocarbon C_{33} H_{66} which he had built up in the laboratory; so here it will be seen that we are within the limits of possible synthesis. Kossel showed that these can be broken down into yet simpler bodies of the *amino-acid group*, Histidin, Arginin and Lysin, C_6 H_9 N_3 O_2, etc. In fact, the researches of Curtius, Hofmeister and Emil Fischer have demonstrated that the proteins in general are composed of these amino-acids—that they are compound molecules composed of these amino-acids joined in series. I do not wish to enter too deeply into what is a difficult subject to grasp. I will only say that the amino-acids are compounds of carbon, hydrogen, nitrogen and oxygen that have the structure of fatty acids,—bodies of the butyric and acetic acid group—to which nitrogen-containing *amine* molecules (of NH_2) have become linked, giving them the remarkable property of being at the same time basic as well as acid, so that they can enter into combination at one and the same time with acids and bases. It is this particular property that would seem to be at the bottom of their striking characteristic of forming huge compound molecules. Thus, suppose we regard them as bricks, having at one end an acid affinity which will attract and attach a basic body, and at the other a basic affinity which will attract and combine with an acid body, it will be seen how thereby it is possible to build compound molecules formed of long chains of these amino-acids. And proteins are bodies of this nature.

This is no longer a matter of theory. The long-continued studies of

the great German chemist Emil Fischer have in the last few years been crowned with brilliant success. Briefly, he has not only isolated a long series of these amino-acids, but following Curtius, has been able to synthesize them, that is, to make them in the laboratory from simpler substances; but also, having done this, he has succeeded in linking them together in series. In one case he linked together as many as eighteen amino-acid radicles. These *polypeptides* as he has termed them, in appearance, reactions, (such as the characteristic Biuret reaction, which we use commonly to detect the presence of proteins) and in behaviour towards acids and alkalies, so closely resemble the true peptones that, to quote Fischer, they must be regarded as their nearest relatives. And Fischer has gone further than this. In the Faraday lecture delivered by him in London in 1907, he announced that one of the bodies artificially built up by him (*l.* leucyl- triglycyl- *l.* tyrosin) has all the properties of the albumoses—of certain simpler proteins which we gain by the peptic and tryptic digestion of muscle.



Thus at last there has been accomplished the building up of these specific organic substances which in nature are found solely in the outcome of life,—nay more, form the material basis for the manifestation of life. It is the most notable achievement of the new century.

Here let me again emphasize the fact that these proteins which thus we are now in a position to build up, or if you like the term, manufacture in the chemical laboratory, are inert bodies—they are not living as we understand the term—the living matter is not proteid, but proteidogenous. Can we form a chemical or physical conception of the difference between the two? between living and dead organic matter?

"Here is a fact, the meaning of which is of far-reaching significance. "I show you two tubes. Each contains a small quantity of a white "powder—about half a teaspoonful. Each powder consists of the same "elements, oxygen, hydrogen, nitrogen and carbon. One is practically

"harmless; the other contains within it the power of death to a thousand "men. The one is quinine, the other aconitia—the alkaloid which makes "so deadly the plant whose flower our ancestors called monkshood, in "the far-off days when the original was often before their eyes. It is "an almost startling fact that in this minute quantity of powder, hardly "visible to those at a distance, there is such a potentiality of death. "Picture to yourselves a thousand men. That which is in this tube "would end the life of every one of them. Here is a latent power beside "which the lightning flash is feeble, and to which the earthquake might "give place, as far as the comparison depends on lethal certainty.

"But the resemblance in the aspect of these two substances is not all. "As I said, each consists of the same elements—each is made up of "carbon, nitrogen, oxygen and hydrogen. Each consists of the elements "which compose air and water, with carbon added. Why is one almost "harmless and the other a most deadly poison? I might ask the question "regarding many other substances composed of the same elements, but "between these two the resemblance is strikingly close. The answer to "my question may be given, 'It depends upon the chemical constitu-"tion.' True, but this takes us a very little way. When we discern that "the difference depends upon the way in which the elements are arranged "in molecules, and the molecules are grouped together, we are not much "nearer an explanation. We see a little more, however, when we realize "that chemical constitution means that energy is held 'latent' (as it is "said), ready to be released when the elements form simpler, closer "compounds. *All vital function of the body depends on a like simpler,* "*closer union of the elements which make up complex organic com-*"*pounds. As far as we can see, all the energy which is released in the* "*animal body, is released in consequence of chemical action under the* "*mysterious influence of life.* Where such closer union of the elements, "and such release of latent energy are going on, the process may be "changed entirely by the contact of molecules of allied constitution, with "latent energy on the point of release, so held as to blend with that "which is being set free in the living tissue. Blending with this, it may "augment or oppose. Remember that difference in chemical constitution "means difference in the readiness with which the elements separate and "reunite and release their energy. Remember also that minute differ-"ences in constitution enable these chemical compounds then to blend "with the vital action in one structure, or to be absolutely inert. It "must depend on differences in the vital chemistry which underlies "function, although these differences which determine *affinity* or *indif-*"*ference* we can discern only by the result.

"Nerve force, as far as we can see, is the result of chemical change "occurring under the influence of life in the molecules which compose "nerve tissue. Chemical processes, the breaking up of complex com- "pounds, and the formation of simpler compounds, with consequent re- "lease of the energy held latent in the former, is the constant element "in the production and conduction of nerve impulses. Some chemical "compounds may come into relation with the tissue in which the change "is occurring without exerting the slightest influence upon it. But an- "other substance may come even in amount inconceivably minute, whose "molecules are so arranged as to fit, as it were, with the changing mole- "cules of the living tissue. The energy the new molecules bear seems to "blend with that which is in process of ordered release in the living "tissue, and to blend so effectively as to derange it entirely. Such an "influence as I have spoken of seems to be exerted widely in the case of "aconitia. Its contact with some living nerve structures seems to be so "instant and precise as to induce the production of an excess of energy, "sweeping all before it; on others, to oppose the process, to induce a "sudden stillness among the changing molecules, and to arrest all action. "Among the nerves thus influenced may be those on which depend the "action of the heart, and with a sudden spasm or a sudden stillness, the "heart stops and life is ended."

I have quoted these last three paragraphs from a clinical lecture delivered several years ago by Sir William Gowers. I have not altered his words; they approach near enough to what I wish to impress upon you to serve my purpose. They lay down in a striking manner that the sole difference that we can determine from a chemical point of view, between the living, palpitating matter and protein, between "imperial Cæsar" and his own dead "clay," is brought about by chemical combination; by the entrance of certain molecules into combination with the living or *biophoric* molecules of certain controlling cells of the organism, and forthwith, from being active and reactive, these become inert—dead—protein. That some similar change takes place in connection with the death of the tissues in general is indicated by the change in reaction when any cell passes from the living to the dead state. Living matter has a feebly alkaline reaction; with the onset of death, the reaction becomes acid. Or, otherwise, in passing from the relatively unstable proteidogenous to the dead, relatively stable proteid state, the biophoric molecules either take up alkaline molecules (or ions) from the surrounding cell sap, or give up acid ions to the surrounding fluid; they surely undergo chemical change.

Now the very constitution of the protein molecules, as revealed to us

by the researches of Hofmeister and Fischer, explain how this must be. These amino-acid radicles which compose the protein molecule are all built up along the same lines. They have multiple affinities. Possibly I here delve too deeply for some to follow me, but an elementary knowledge of chemistry and of chemical nomenclature is a part of modern culture, and therefore I presume to venture, and the accompanying diagrams may help to explain my meaning. From our knowledge of the constitution of the protein molecule we may regard the biophoric or living molecule as made up of a series of amino-acid radicles joined together in ring form. Fischer's studies have taught us the mode of junction of these radicles; it is by the acid carboxyl (C O) group of the one radicle to the alkaline amine (N H) group of the other. To this extent the radicles or nuclei are relatively firmly united. The other components of the different amino-acids must then form free swinging or *side chains,* and it is according to how these side chains are built up, that we obtain the different nuclei, or amino-acid components. These are capable of replacement and modification according to the ions or compounds attracted from the surrounding medium. They may be regarded as less stable, able to be detached and replaced.

In discussing what life is, we may therefore, lay down in the first place that *all vital manifestations are manifestations of chemical change in proteidogenous matter, are, in short, the outcome of arrangement of that matter with the necessary* LIBERATION *or* STORING UP *of energy.* To this extent all vital phenomena resemble phenomena of surrounding inanimate nature; they differ from those only in degree, not in kind. There is not one vital activity which can be mentioned that demands for its explanation something over and above chemical change;[1] and to this extent, inanimate and animate nature are one. There is, however, an apparent, most important difference between the results of vital and non-vital phenomena. This has been well put by Earl. "Every living or-"ganism may be regarded as a centre at which energy is being constantly "transformed. It is by the nature of this transformation that we re-"cognize it as a living organism. But," he continues, "the continuous "operation of these transformations in the region of the organism is "distinctive. In all exchanges of energy between inanimate bodies there "is a speedy attainment of equilibrium, whereas the organism, so long "as it lives, is incessantly disturbing the equilibrium which would other-"wise arise between itself and its environment. In other words, living

[1] Even memory has been explained by Hering and others as a reproduction under particular stimuli of particular relationships between particular molecules, so that now they set in order an identical series of reactions in the cerebral cells.

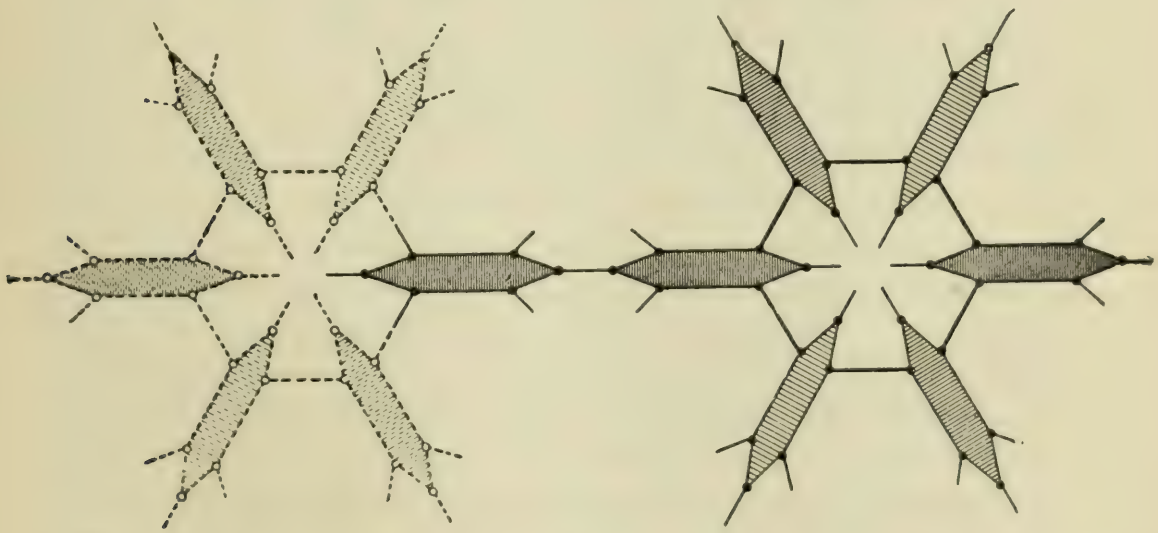
"organisms are not *ordinary conservative systems*, and the extent to "which they *diverge from the principle of the conservation of energy* "is another indication to us that in the organism, we come in touch with "phenomena which are not yet, at all events, reduced to physical laws."

I wish to discuss how far this statement is true, for if true it immediately defines the difference between phenomena of animate and inanimate creation. It will be best, I think, to study the subject by analysing that property of living matter which is the most evident outcome of the incessant disturbance of equilibrium above mentioned—I mean growth.

If we seek to test the relative importance of the various forms in which vital activity manifests itself:—motion, sensation, assimilation, excretion, reproduction, we are bound to see that one and all of these subserve growth. If the individual moves, an ultimate analysis shows that the primary object in motion is either to obtain more food, or more accurately the primary result of that movement is to approach and assimilate foodstuffs, and that food obtained is of benefit, as it can be used for further growth; or is to place itself at a greater distance from disintegrative forces. The same is true also with regard to sensation. That is of benefit primarily in order to acquaint the individual living unit with, on the one hand its closeness to food stuffs, or on the other hand, with the presence of physical or other agents deleterious to the organism. Assimilation and excretion are but the auxiliaries in the due utilization of materials which aid growth, and in removing from the organism all materials whose continued presence would disturb the process. Growth then, is the central or essential phenomenon of life, and to understand life, it is necessary that one gains a clear idea of what is the essential nature of this process of growth.

Let us then consider what growth means. It means *quantitative* increase in the individual matter endowed with life, increase in the living substance. That individual may consist of a single cell, may be an almost infinitesimal micrococcus, for example, or, at the other pole, say in the elephant or in the whale, may consist of a huge aggregate of countless millions of cells, all associated and depending the one upon the other. In this latter case it is the separate cells which, some or all of them, increase in size, and with this, increase also in number. Each cell of such a multicellular organism is, we know, derived from a primitive fertilised ovum by repeated division of the original single cell; and in this process of division, there is a partition of the bioplasm, of the vital matter. During the period of most rapid growth, in the stage of development, this increase in size of the individual cells and their multiplication is most rapid, and when we

compare the adult with the ovum from which it sprang, when we know that in suitable environment, a single bacillus, for instance, dividing, can, in twenty-four hours, give rise to hundreds and thousands, not to say millions of bacilli equal in size and identical in properties to the original bacillus—one observer has estimated that in the breeding of the unicellular Rotifer, if all the possible progeny could be preserved, there would in the course of a year be developed a mass of organic living matter as large as this world of ours—we can have no doubt, not merely that growth means a heaping up, through the agency of the essential vital portion of the protoplasm, of secondary substances, not in themselves living and vital, but that that living matter itself is marvelously increased in amount. There is no other possibility open to us. But now, can we picture to ourselves the nature of such increase in the vital substance, the actual bioplasm? I think we can, and that by the use of current chemical conventions and symbols. The actual process must, I admit, be vastly more complicated than the diagram we employ can represent. But that doesn't matter. If, by the use of a simple diagram, we can depict and can grasp the nature of the process, then we have gained a great step in advance; only, while using such a simple diagram, we must remember that it is but a symbol, it is like using the symbol π to represent that interminable fraction 3.14159265.... etc.



Thus far I have pointed out that all vital processes are manifestations of energy, and that such manifestations of energy surely indicate chemical change. Thus the substance or bioplasm endowed with life may be regarded as a single chemical substance, varying, it is true, in its properties in the different species and forms of living beings. If a chemical substance, then it is formed of molecules. I have already given you the

conception of the structure of the biophore or molecule of living matter. Let us reduce this to its simplest form—as a ring of carbon containing nuclei built up after the type of a benzole ring, with which the chemists are familiar in the large group of benzene compounds. Each nucleus of such a ring may, for our present purposes, be represented by one of the more complex amino compounds already referred to. Such nuclei are polyvalent—they have, that is to say, multiple affinities which can be satisfied by the attachment of other atoms as radicles. It will be seen that to make a ring, two at least of the affinities of each amino-acid nucleus must be satisfied by junction with other nuclei, leaving, however, other unsatisfied attachments. And it is in accordance with the way in which these unsatisfied arms become satisfied—according to these side chain combinations—that the different benzene derivatives are formed.

It is interesting to note that even among these relatively simple carbon compounds—those familiar with chemistry will appreciate the virtue of that term "relatively"—we find already that there is indication of selective activity. I mean this, that once one of these bodies or derivatives has been formed and becomes partially broken down, it is found more easy to obtain new associations after the original type rather than new associations of a different order. Even among the simpler carbon compounds we see the faint origin of what, biologically, we speak of as habit. The same is true of radicles in general. Once certain compounds are formed, the adhesions or attachments are more close, more fixed. So now to continue. Let us suppose this simple annule of living matter with certain side chains already attached, floating about in a fluid medium in which, through a concatenation of circumstances, various odd ions are similarly floating free. The unsatisfied arms of the ring are liable to be satisfied, that is, to attract and fix on certain other ions. All that we have to do is to suppose this particular annule attaches to one unsatisfied arm a floating ion of carbon, that this then so attaches itself to other carbon ions until a second ring is formed in association with the first. Then this ring similarly attaches to itself side chains in the identical order seen in the first instance.

Now behold, there is built up a second annule of identical nature, which when once formed, may break loose. In place of one annule we have two, and as the properties of any chemical compound depend upon its composition, the composition determining how, and how much, energy is liberated under certain conditions, so, gentlemen, if the composition of the first annule, as we agreed, was such as to confer upon it the properties we term vital, the second annule will possess the identical pro-

perties. In place of one living molecule, we have two; in short, we have growth.

But stop, you will be saying. By what earthly right do you assume that chance ions floating in a fluid medium come to attach themselves one to the other in due and regular order, so as to form a ring with side chains identical with the original ring with its side chains, with which the first of these wandering ions became connected? You admit at the start that this original ring and side chains are immensely complicated, and that our diagram represents an absurdly simple case; how can you have the face to make any such proposition?

All I can say, gentlemen, in reply, is that I have precedent upon my side. What happens in crystallization? You have a watery solution, say of common salt. You now know that though you place solid sodium chloride, a definite chemical compound, into that water, in the very act of solution, the ions of chlorine now dissociate themselves from the ions of sodium. Molecules of Na.Cl. break up, they are no longer there as such. You now cause this solution to evaporate and become concentrated; what happens? As the water volatizes do the ions of the gas chlorine escape into the air, leaving the heavier sodium ions behind? Not a bit of it. Inevitably when the concentration reaches a certain point, some ions of the sodium, aided by some sharp point or inequality in the surface of the vessel, once more join themselves each to an ion of chlorine, and the process of crystallization begins. The very existence of one crystal clearly seems to cause other junctions to occur in its neighbourhood, and *just that one particular series of junctions necessary to form sodium chloride,* so that, although there may be present in the solution various other substances, various other ions, yet they are not attracted, they remain still in solution to a very great extent; we gain pure, or almost pure crystals of the one substance. Here we have a process of the very same order to that which I contemplated above, a process of definite, inevitable or selective attachment of ions in a certain order, given certain definite conditions. Certain particular ions unite and build up the molecules and crystals of one particular inevitable form, of one particular composition.

Here again the example is very simple; I might, it is true, have mentioned solutions of salts of a more complicated nature, but again I hold that the simplest case is good enough, nay, is best, upon which to base my contention, which is that we have to recognize the existence of this affinity or attraction, or whatever you please to call it, whereby certain freely floating ions, and combinations of ions under certain definite conditions, tend to attach themselves one to the other in a definite order, to form bodies of a definite composi-

tion. And, gentlemen, in this connection, is it not, to say the least, suggestive, that a fluid menstrum is essential for vital processes? Such fluid menstrum, we now know, is essential for the breaking up of salts into their constituent ions, so as to bring about the formation of new combinations, and that in the absence of great heat. Is it not suggestive, that we, for example, are over seventy per cent. water; that the actively functioning, as apart from the inert tissues, contain still greater proportions—and the same is true throughout living nature; that we have in the living cell just those conditions favouring alternate ionization and crystallization of the contained molecules, and that the dominant and characteristic element present in the living matter is one which we find relatively wanting in this earth of ours, save in connection with living matter, or matter like coal, which has been alive; and that element, carbon, is, unlike the majority, tetravalent, and therefore so peculiarly liable to form extensive and complicated attachments. It would almost seem as though all the carbon present on the surface of the earth inevitably becomes utilised to form and to give rise to living matter. The same is largely true, too, as regards the nitrogen.

In short, gentlemen, were I a Frenchman, I would say:—La vie c'est la crystallisation. Life is the by-play of carbon-nitrogen compounds now breaking up and liberating energy, now attaching to themselves other ions, and so storing up energy, deduplicating themselves, and undergoing growth, or as I have expressed it elsewhere, life is to be regarded as a state of persistent and incomplete recurrent satisfaction and dissatisfaction of certain proteidogenous molecules.

If we accept this view, and the more I ponder over it, the more convinced am I that it is along the right lines, where is the wide difference I quoted to you as being observed between animate and inanimate nature? Where is that violent, not to say indecent assault upon the otherwise universal and ever to be respected principle of the conservation of energy? Life and growth come under the category of chemical processes such as we are familiar with. All that we have to recognize as separating what we term animate from what we term inanimate nature is that, from the intimate constitution of carbon, it is able to form combinations of a marvellous complexity—unsatisfied compounds which, therefore, are in a state of unstable equilibrium, which easily break off certain side chains already attached, thereby giving off energy, which as easily, under certain conditions of environment, attach other side chains to them in definite order, thereby storing up energy and undergoing growth.

I would dwell for a moment upon this point made by Earl, and already referred to, namely, the remarkable condition of persistent, un-

stable equilibrium of living, as distinguished from non-living matter. The distinction, I would say, not so absolute as he lays down. Once more, it is a matter of degree. Non-living matter is only in a condition of relatively stable equilibrium. Our earth, for instance, taken as a unit, is only relatively stable. If astronomy teaches anything, it is that each planet, each sun, each solar system, has its periods; that each begins in a gaseous state, a state of enormous instability, enormous liberation of energy; that from the nebulous stage, as a result of the mutual attraction and combination of its elements, it undergoes a stage which is strictly comparable to that of growth and then settles down into partially —and only partially—independent systems, with a certain storage, and a certain dispersal of energy. But our earth, for instance, is subject to progressive change, and is far from being eternal. Sooner or later in the æons that are to come, our sun will become exhausted as an energy distributing centre; the system will be dead. Sooner or later in æons far, far distant, the attraction ever present between planet and sun, and sun and other suns of yet greater systems, will draw planet unto sun, and sun unto other suns, and with each act, so colossal will be the force exerted, the force of impact, that what is now solid and fixed will once more be dissipated; the equilibrium is but temporary, the return to the nebulous stage inevitable.

But true it is, all the same, that the equilibrium of living matter is most markedly unstable, and this instability is essential for active dynamic life. We are never satisfied. Render the living molecule a satisfied body, with all its side chains complete, and unable to make attachments with other ions, so that no further interactions are possible between the molecular system and its environment, and it must come to rest, and function be at a standstill, all indications of life ceasing. It is quite possible that, as Gowers indicates, certain poisons act, and thereby induce death, by combining with the molecules of certain all-important centres in such a way as to satisfy those molecules, and so arrest function and further activity. Other poisons and physical agents may likewise cause death by the contrary process of decomposing and breaking down the molecules, whereby they become so gravely disorganized as to be unable to continue the progressive series of attachments and of liberation of side chains which are the underlying features of the vital process.

I could expand this conception, and dilate for long upon its many bearings. Once we accept this chemical theory of growth, if I may so term it, it is wonderful how it illuminates and harmonizes a whole host of phenomena regarding which there are hosts of theories, having this

in common, that they do not adequately explain. I could spend some hours of your time applying this conception to the subjects of evolution, of descent, and of inheritance, the inheritance or non-inheritance of acquired properties, the inheritance of disease, the immunity from disease, and so on. But I will desist; it may seem to you that I have already gone too far. But in defence of myself, I am prompted to quote some words of the good old Stephen Hales, Vicar of Leddington, near London, in the reign of George I., who was the founder of modern exact physiology, based upon accurate measurements, and quantitative rather than qualitative studies. "In natural philosophy," he says, "we cannot depend on any mere speculations of the mind; we can only, with the mathematicians, reason with any tolerable certainty from proper data such as arise from the united testimony of many good and credible experiments.

"Yet it seems not unreasonable, on the other hand, though not far to indulge, yet to carry our reasoning a little further than the plain evidence of experiments will warrant; since at the utmost boundaries of those things which we clearly know, there is a kind of twilight cast from what we know on the adjoining borders of terra incognita. It seems therefore reasonable to indulge conjecture there; otherwise we should make very slow advance in future discoveries, either by experiments or reasoning."

I have, it may be, conducted you to this twilight land on the borders of terra incognita. I shall be satisfied if I have set you thinking; if I have indicated to you, though vaguely, that life is not a thing peculiar and apart: that it is a portion of a larger whole; that animate and inanimate nature conform to the same laws, the same principles of chemical association and dissociation. Vaguely, but no less surely, we find the same laws at work throughout nature in all its aspects. The processes which determine the structure of the atom, determine the properties of all aggregations of atoms; what rules the mighty sun, rules also the less than visible microbe.

ON THE USE OF RADIUM IN PARIS.

BY

G. E. Armstrong, M.D.

One of the interesting questions in Medicine to-day is the nature of radium and its therapeutic value in Medicine and Surgery. It is, indeed, a subject in which Canadians should be especially interested and in which they might be pardoned for taking a reasonable pride. Although radium was not discovered in Canada, we have with us this evening Professor Cox who discovered Rutherford, and much of the knowledge of the world to-day was worked out by him in McGill University. In this work he was ably aided and encouraged by Dr. Eve, himself an authority on radium of international reputation, who also honours us with his presence.

It is not strange that there should have been a readiness to investigate the therapeutic value of this remarkable substance that spontaneously generates heat, light and electricity, and to determine if these remarkable powers could not be used for the relief of human ills, and, perchance, to overcome diseases hitherto beyond our control.

It was with the object of learning what had been accomplished in this direction that I visited Paris in the early part of last month, that I might see for myself what success had been attained in the use of radium as a therapeutic agent at the Radium Institute in that city.

The Institute has been organized and is under the direction of Dr. Louis Wickham, physician to the Saint-Lazare, and ex-chief of the clinique at l'hopital Saint-Louis, and Dr. Degrais, Chief of the laboratory at l'hopital Saint-Louis.

Dr. Wickham and his associate impressed me as men who were thoroughly scientific and deserving of our full confidence. They have a consulting room where they receive the patients, examine the lesion and prescribe the strength and form of the apparatus to be used, and the frequency and duration of the application. There is a large room adjoining where the patients receive their treament, and in another part of the building are three laboratories, a physical, a biological, and a pathological under the care of Dr. Dominici, who, by the way, was not in Paris at the time of my visit and whom I had not, therefore, the pleasure of meeting.

They are studying the action of radium very carefully and thoroughly and keeping very full notes of every case.

They have comparatively little to say. They show their cases, tell all they can about them and allow the observer to draw his own conclusions. They are not yet prepared to make any definite statements or to compare

results obtained by the use of radium with those obtained by other means. If the question is put to them they simply reply that they have not yet sufficient experience to justify a comparison.

The first to study radium therapy was M. Danlos, and he studied its action in vascular nævi. His last memoires appeared in the "Bulletin de la Société Médicale des Hôpitaux" for Feb. 10th, 1905, in which he said that in small vascular nævi, after the application of radium for an hour, repeated, if need be, at intervals of three weeks, he had obtained a small white cicatrice, and he presented to the Society a new form of apparatus exactly similar to that now used, namely, the radium spread out on a surface and there retained by a varnish.

M. Rehns obtained a good result in vascular nævus of the arm. Among other early workers were Mr. Hartigan, who in 1904 applied it to a nævus of the face; Dr. Ekstein of Prague, who used it in a case of telangiectasis on the back of the hand; and M. Boikov of Kharkow.

As to its action and method of employment I may say that radium offers the best example of radio-active properties so far discovered. This radio-activity is one of the forces constantly liberated from radium. It manifests its energy by various phenomena. It renders the air a good conductor of electricity (the phenomenon of ionization); it impresses photographic plates; it traverses opaque bodies; it changes the colour of certain substances; and, what is most important of all to us as physicians, it modifies the cells of living tissues. It can be made to destroy them or to simply influence their evolution. It gives off a gas called emanation and rays. The rays are particularly concerned in the treatment of vascular nævi.

These rays, as probably most of you are aware, are divided into three groups, the α, β, γ. The α and β rays are the particles issuing from the disintegration of the atoms of which the radium is composed. These particles (ions and electrons) are charged with electricity, positive from the α, and negative from the β rays. They are infinitely small; those of the α are compared to the atoms of hydrogen, and those of the β rays are 1,000 to 2,000 times smaller. They travel with great rapidity; the β rays with the rapidity of light, 300,000 kilos a second, and the α 20 times slower.

The γ rays are not material like the α and β, and consist of a form of perturbation of the ether, some of shorter and some of longer undulations. They pass with extreme rapidity and infiltrate the elements of the tissues. The α, β and γ rays do not pass through opaque substances with the same facility. The α rays are stopped by a little absorbent cotton; the β rays go further and the γ rays are the most penetrating of all.

This knowledge of their penetrating power has led to the application of the principle of filtration, the α rays being filtered out by cotton, the soft β rays by mica, the hard β rays by a few mm. of lead, while the γ rays will pass through an inch of steel.

The rays are sometimes filtered through the air, *i.e.* the apparatus is kept at a distance from the patient.

In what particular way these rays modify the tissues is a question being actively studied, but which cannot yet be defined precisely.

The salt generally used at present is the sulphate combined with the sulphate of barium, and the radio-activity is measured by the degree of force with which it renders the air a good conductor of electricity (the phenomenon of ionization). The maximum force of pure radium has an activity of 2,000,000, and when one speaks of an action of 500,000 or 100,000 one thus indicates the amount of barium mixed with the radium and the figures represent the power of ionization which is 500,000 or 100,000 times greater than an equal quantity of pure uranium which is taken as the unit of measure.

The activity, then, of the apparatus depends on the quantity of radium incorporated, the method of application, the fixity of the grains, the dimensions of the radio-active surface and the permeability of the substance with which the radium is fixed.

It has been used very largely in the treatment of vascular nævi and the results have been classified, particularly with reference to the size of the lesion, the depth to which the tissues are involved, the degree of dilation of the vessels, etc., each variety requiring an apparatus especially adapted if the best result are to be obtained.

The histological changes taking place are thus exposed by M. Dominici and M. Barcat. The fibrous bundles and elastic tissues in the walls of the blood vessels are absorbed; at the same time the fixed intervascular, connective tissue cells of the vessel walls pass into a state of embryonic tissue. The embryonic connective tissue proliferates and forms a connective tissue net-work. This results in a gradual retraction of the blood spaces.

The angiomatus tissue is thus replaced by embryonic connective tissue cells between which are stretched the vessels which become relatively small and infrequent. The cells of the young connective tissues are disposed parallel with the surface of the skin and reconstitute an adult connective tissue. There is secreted new connective tissue bundles and new elastic fibres.

The new connective tissue has many characteristics different from inflammatory cicatricial tissue.

1. The superposition of the fixed cells of the connective tissue bundles and the principal elastic trunks follow a regular stratification.

2. The absence of expansion of the newly formed connective tissue beyond its natural limits, and, therefore, beyond the surface of the skin.

3. The delicateness of the newly formed connective tissue bundles.

The apparent confirmation of the cutaneous surface is in accord with this structure. The skin remains uniform, flat and soft in the zone previously occupied by the angioma.

The histological changes in the cure of the nævi consist essentially in the modification of the evolution of the vascular connective tissue produced by the action of the rays. These determine an embryonic fusing of the angiomata following the reorganization of these elements in the form of connective tissue fibres of a regular and uniform texture.

This theoretical explanation is based upon the researches which Drs. Dominici and Barcat have made with regard to the modifications impressed by radium upon the normal skin and various pathological tissues (tuberculous, cancerous, sarcomatous and telangiectatic). In all the studies of these authors the radium rays have in a similar manner influenced healthy and normal tissues.

It is remarkable that these changes are produced without any subjective sensations of pain or heat. The apparatus is generally applied and held in place by a strip of adhesive plaster. As these patients are often infants, the absence of pain or discomfort obviating the necessity of any local or general anæsthesia is a valuable feature.

Then again the æsthetic result would seem to be most satisfactory. The redness is replaced by skin of almost quite normal feeling and appearance.

Port wine stains and pendulous vascular tumours can be removed. I know of no other agent that can accomplish this.

In the treatment of pigmented nævi the action must be more severe, sufficient to cause vesication. Healing takes place in from 30 to 50 days, a normal surface results. Only small areas should be treated at one time.

The treatment of tuberculous lesions by radium has not been so satisfactory. Nevertheless some very encouraging results have been obtained in lupus vulgaris, lupus erythematosis, scrofulous ulcers, etc., but slowly and sometimes with a tendency to recurrence. Trials have been made with hypodermic injections of weak solutions of radium.

The results obtained in epitheliomata of the skin are sometimes apparently favourable. Rodent ulcers seem to yield readily. By this I mean more than the cure of an ordinary small rodent. In cases of deep

and extensive destruction of tissues, cases that might be considered almost inoperable, the destructive ulceration has been arrested and the surface converted into a healing sore and in some cases apparently cured. In one such case at least, ulcerating glands behind the ear have been almost healed.

Wickham and Degrais have been very careful in their statements regarding the action of radium on epitheliomatous tissue. They say, quite rightly, that in the matter of cancer, more than in any other condition, we must be careful not to draw conclusions from a small series of cases and from too recent results. Recurrence must always be feared. A definite opinion cannot be given until a larger experience is obtained and a longer time has elapsed. There are reasons for thinking that radium has a selective action on cancer cells. Dr. MacKenzie Davidson of London, assured me that in rodent ulcers radium had a selective action and did not touch another cell. Such an opinion from MacKenzie Davidson is certainly worthy of our serious consideration.

One case of epithelioma of the tongue is reported as cured. I was told that the diagnosis in this case had not been confirmed by a microscopical section. I saw one case of epithelioma of the tongue under treatment. In this case the examination of a microscopical section had confirmed the diagnosis. It was an early case and no enlarged glands were palpable. The ulcerated area was situated on the right border of the tongue about opposite the first molar. It was quite as large as a ten cent piece. It certainly felt soft and lacked almost entirely the usual indurated feel. The base was clean, there seemed to be rather less than the usual tenderness. I was assured that the latter characteristics had appeared since the treatment by radium. The sore was certainly very far from healed although apparently improving.

In three cases of leucoplakia, two of the tongue and one of the lower lip, Wickham and Degrais obtained happy modifications. In three cancers of the lower lip one recurred after two months of apparent cure and two remain well up to date.

Dr. Dominici and Prof. Gaucher have obtained the best results in epitheliomata of the lips and mucous membrane by the use of the γ rays alone and in feeble quantity.

The rays have given admirable results in deforming cheloids, the result of trauma and burns, in eczema, impetigo, pruritis and small external hæmorrhoids.

They have not, so far as I could learn, made any attempt to apply radium to deep-seated or intra-abdominal lesions.

In Paris they are rather fond of placing an apparatus on each side

of the tumour—or in the case of the cheek, of placing an apparatus inside in the mouth and one outside. This they call "cross fire."

They are exceedingly conservative in the use of radium, both as to strength, quantity and duration of application. They have had a few troublesome burns, two of which I saw during my visit at the Institute.

THE ESSENTIAL CHARACTER OF HYSTERIA.

BY

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Our regrettable reliance upon the *ipse dixit* of a great name is again illustrated by the rearrangement now occurring in our ideas on hysteria. The present "Trend of the Clinical Concept of Hysteria" (1) (*Boston Surg. and Med. Jour.*) has turned, under the guidance of Babinski, (2) towards ideas which were placed in the background by the clinical picture of the "grande névrose" drawn by Charcot. That is to say, the earlier conception of Bernheim (3) has received its due; and most neurologists in France at least, have acceded to the proposition that a "hysterical symptom is one susceptible of production by suggestion and of removal by suggestion-persuasion." Bernheim, however, (4) now considers the phenomenon of suggestibility to be normal, and the emotional attacks (les crises de nerfs) are for him the only hysteria.

In actual practice in English-speaking countries at least, the heresies of Charcot have had little influence, except perhaps among a few neurologists. The reason for this I shall not attempt to explain.

Let me recall an experiment which Joire (5) conducted in the early nineties with a girl named Marie. During hypnosis, it was suggested that she see her name written upon a translucent card. She was then asked to trace the letters she saw; and did so thus M A R I E. She was again hypnotised, and the experiment repeated; but this time, the surface of the card which she had seen was turned away from her against a window so that any letters would appear reversed as they were seen through the card. She was again asked to trace what she saw and did so as follows— "E I R A M." She must therefore have perceived that the card had been reversed; for she acted in conformity with that idea; but she did not really *see* the letters; for had she done so, they would have appeared M A R I E. This conclusively proves that she had only the *idea* of the reversed letters, which she tried to portray to the best of her ability. She had no sensation; it was not an hallucination. The ease with which she perceived that the card had been reversed indicates how cautious one should be in having recourse to metaphysical explanations of phenomena.

Bernheim (6) too showed in 1886 that the amaurosis and dyschromatopsia in hypnotic states were not sensory defects but that they were indeed simulated, as he believed, unconsciously. Again, the credulity of some observers that cortical areas could be inhibited during hypnosis by striking the skull over them with a hammer should not have been possible in face of the critique of Jules Soury, (7) who showed that the function under experiment went into abeyance in conformity with the observer's belief about cerebral localization; for instance:—Rainaldi's (8) patients lost the power of smell and taste during hypnosis when they were tapped over convolutions 01, and 02, while other observers produced this effect only when tapping over the uncus. Similar differences were evidenced in other areas, as Soury bitingly said "in conformity with the text-books read by the observers."

Such considerations should long ago have undermined the fantastical superstructure which hysteria became; but it was not until last year's discussion at the Paris Neurological Society (9) that the real destruction of the older hypotheses can be said to have occurred. There, it was unanimously decided "that among the phenomena usually included in hysteria, there is a special group of symptoms which can disappear under the influence solely of suggestion or persuasion: in particular, certain kinds of convulsive fits, paralyses, contractures, anæsthesiæ, hyperæsthesia; of modifications of the special senses and of difficulties of speech; as well as certain respiratory, digestive, and other troubles." The genesis of these is fully discussed by the present writer in International Clinics of last October. (10) They are most easily induced in states of suggestibility exaggerated by organic disease, which diminishes critical power, the faculty of awareness, which does not concord with suggestion. It is very difficult for the observer to avoid suggesting that in which he believes. Hence, the constancy with which the stigmata were found; but Babinski (11) has not during the last ten years seen anæsthesia in cases not previously examined medically. The medical manufacture of hemianæsthesia is illustrated by the case of traumatic neurosis in which Dupinet saw (12) another expert actually call forth a hemianæsthesia which had not been present before. This experiment is not too difficult to be repeated in nearly any hospital ward. The nervous crises which formerly made of the Salpetrière a pandemonium no longer occur there, because the suggestion of their occurrence no longer obtains. (13)

The finding of causative suggestions in other hysterical manifestations is entirely proportional to technical skill in the search.

It is pretty clear by now (14) that suggestion has no influence over

the tendon reflexes, the true cutaneous reflexes, the circulatory and trophic functions, (14a) the disorder of which may produce dermographia, urticaria and other eruptions, ulcers, œdema, hemorrhage, or gangrene. Nor can the temperature, nor the secretions of urine, saliva, and sweat be influenced by suggestion, except in so far as they are called into action by emotion. Mobility of humour is a commonplace in hystericals; and this mobility is amenable to suggestion: hence it is theoretically possible to affect the secretions indirectly by suggestion through the emotions. But positive facts in demonstration of this have not yet been adduced convincingly. In the numerous cases hitherto presented, trickery cannot be excluded. Medico-legal literature teems (15) with mythomanic cases, such as that of the man who confessed to concealing a syringe in the rectum, and in whom, in a moment of excitement, an evacuation revealed two. The number of those cases which "could not possibly have had access to any means of provoking their symptoms" only indicates the looseness with which such negative evidence is accepted; as for instance in a case of alternating mydriasis I observed in Babinski's clinic; (16) for though the patient's father indignantly repudiated the mere statement thereof, it was found that his daughter had been placing in her eye drops of an atropine solution filched from her employer. Of course, mythomania, a type of moral degeneracy, a form of lack of adaptation, a weakness which resorts to trickery, may be and generally is accompanied by suggestibility; so that academically speaking, a deliberately produced lesion simulating spontaneous disease which the patient is trying to imitate may deserve the term hysteria; for of course, imitation is one of the forms of suggestion. These considerations are applicable to many cases of so called neurasthenia, (17) very often to the traumatic neurosis, (18) and frequently to the false gastropathies. (19) The false neurasthenic is a creature who, wounded in *amour propre*, solaces himself by retirement from further wounds: he is a simulator, more or less unconscious, and is curable by a removal of his unreal belief. Similarly, a traumatic neurasthenic tenaciously clings to the false fixed idea which holds him in disaccord with the environment, until he achieves the solatium he craves. Sometimes, however, the old man of the sea takes so strong a hold that he cannot be cast off: like the widow, he has nursed his grief until it becomes stronger than he. The gastric neurotic too must be cured by the destruction of his erroneous fixed belief in his digestive incapacity. (20) All of the foregoing false fixed ideas are hysterical, as they have arisen in suggestions whether they originated directly from an injudicious physician, a too sympathetic friend or

indirectly from the gossip of neighbours, or the store of the patient's memories. And all are curable by suggestion, or better, by persuasion. The latter is constituted by the patient's awareness of the steps traversed; (21) whereas in suggestion, he does not know how the newer idea has been implanted in his mind; for it is inculcated either by authoritative assertion, or insinuated while his attention is distracted elsewhere; in either case, received without critical examination.

More careful investigation of the psycho-neuroses has now shown that many of the annoying, harassing, indescribable sensations which make life a misery to certain people have nothing to do with hysteria. They are cenesthopathies, (22) that is disordered impressions from the organs not derived from without: they are somatopsychic affections. Common in the psychose, they may be quite monosymptomatic, and even unaccompanied by hypochondriasis. They are in no sense hysterical.

Another important kind of symptoms not derived from suggestion are those lately placed together by Janet under the title of Psychæthenia. (23) He has shown how unamenable to suggestion are these. The crises of agitation (24) these patients often undergo have been labelled hysteria countless times. They are essentially different, as is the whole clinical picture. The main differentia are:—

"Firstly, as to fixed ideas, their duration in hysteria tends to be long; for though they are easily buried and forgotten, they are resuscitated with great ease and infallibility; whereas in the psychasthenic the fixed ideas are very mobile, but keep recurring voluntarily and indeed become cherished parts of the individual, and are far more difficult to eradicate than those of the hysteric. Secondly, hysterical ideas are evoked by well defined and not numerous association "suggestions;" in the psychasthenic they are often evoked by apparently irrelevant association, which are searched for by the patient; thus the "*points de repere*" are very numerous, cannot be predicted with certainty, and are often mere excuses for crises of rumination or ties. Thirdly, in the hysteric, the ideas tend to become kinetic, whereas the psychasthenic's constant state of uncertainty causes him to oscillate between "I would" and "I would not." Inhibition is too strong to allow an act, but not strong enough to dismiss the obsession." (25)

As to the crises, those of hysteria cannot be distinguished from those of psychasthenia or epilepsy, except by the property of being produced and removed by suggestion; for the foregoing criteria demonstrate the invalidity of the distinctions formerly drawn by Janet and others with regard to loss of consciousness, amnesia, automatism and power of arrest. (26) Recently, Ernest Jones (27) has insisted upon the need formerly

expressed by Janet of studying the mentality between the crises in order to appreciate their significance; and this necessity remains true, although the dissociation hypothesis on which it is based is by no means beyond criticism. Walter Scott (28) has recently attempted to rebut it in a case cured by suggestion without regard to the sejunction of hypothetical buried complexes; and although his case and argument do not convince, I believe that the synthesis only awaits the labours of men of ability and clinical experience equal to that of such men as Jung, Morton Prince, Sidis etc.

The criterion of suggestibility makes necessary a revision of the conclusions of Hoche (29) and Heilbronner (30) on hystero-epilepsy. They believe that even fixed pupils and sphincter relaxation may occur in simple hysteria.

But it is now pretty clear that reflex iridoplegia indicates organic disease, (31) or at least, if temporary, a profound intoxication, which may produce also marked suggestibility, which, however, is unrelated to the pupil fixation. But sphincter relaxation may occur during profound emotion, as in the terror stricken dog reported by Féré, in (32) which an agoraphobia had been contracted from its mistress. The tendency to the loss of sphincter control during profound emotion is a commonplace; and the reinforcement of this by suggestion can very easily prevent the inhibition by which civilized people and domestic animals counteract the emotions might lead to unpleasant effects. There is a partial loss of consciousness, an insanity if you will, during the first access of every emotion. Thus in the emotion accompanying blushing, timidity inhibits voluntary activities; during laughter, the voluntary control is much diminished; the state of consciousness during such emotions has been shown by Sir Arthur Mitchell (33) to be analogous with that in dreams, during which auto-suggestions dominate the mind. That hetero-suggestions also are influential in sleep and dreams has been proved by the experiments of Morly-Vold (34) and Vaschide and Vurpas. (35) These observers, by stimulating the auditory, tactile and other senses, provoked dreams in accordance with the stimuli used; thus a string tied round the ankle caused the patient to dream that a wild animal was lacerating his foot, and so on. All these states are marked by lack of voluntary control, which connotes exalted suggestibility, that is to say, hysteria. This, then, is the relation between facile emotionalism and hysteria. Emotionalism is not hysteria, except in so far as it favours suggestibility. No one is a greater prey to emotionalism than the psychasthenic; but as Janet (36) has shown, his suggestibility is much diminished; for though he suffers profoundly on account of his

emotions, it is on account of their incompleteness and failure of fruition in act.

The principle is simple enough, but is much complicated by the fact that phobies, tics, and other psychasthenic symptoms may occur in hystericals by imitation (which of course is merely a form of suggestion) or as a consequence of organic states. I have now under observation a patient who is at the same time claustrophobic and agoraphobic on account of a single fainting attack during cardiac enfeeblement due to an attack of influenza. She is in no sense of the word a psychasthenic; it is a phobia by suggestion. Phobias were cured by suggestion, and therefore were probably of the hysterical type, in the instructive case recently reported by Scott. (28) The psycho-analysis, not published in the report, is still more striking in this regard. An example of obsessions induced by suggestion and repeatedly cured thereby was related of a kleptomaniac by Bernard Leroy (37) at the Congress of Geneva. Irresistible impulsions derived from suggestion caused this woman in turn to fall violently in love with an officer whom she did not know; to passionately long for the death of her husband and indeed to make all the preparations for compassing his death, until the culmination of her preparations so horrified her that she recoiled and was cured of that obsession on the moment; and finally the intense longing to steal, which she satisfied by robbing the counters of the department stores.

Hysterical tic can usually be cured rapidly. For examples I must refer to a forthcoming article. (38)

The diagnosis of these pseudo-psychasthenics must be made by the patient's lack of the anguish and other emotional accompaniments to the hindrance of his morbid act; by the absence of sentiments of incompleteness with the various "manias" to which it leads, and by the uncritical irresistibility and absence of struggle of the obsessive ideas and impulsive acts of the false psychasthenic. (39)

The comprehensibility of hysteria, and the simplification of the treatment made possible by the foregoing facts, adds enormously to the precision, and hence the power of the therapeutist; and will remove from our profession the hitherto deserved stigma of inattention to, and ineptitude in face of, the numerous patients suffering from functional diseases of the nervous system and hysteria who have fallen a prey to the charlatan and pseudo-scientist in such vast proportions; it will put an end to the posing of ecclesiastics as mental healers, of metaphysically absurd cults, which undermine the collective intelligence; and lastly it will give confidence to medical men in their capacity to take their

due part in the field of psychic enquiry so avidly pursued by the laity of the twentieth Century.

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AN ACCOUNT OF CANADIAN LEPROSY

BY

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In this brief article I propose to run hurriedly through the history of leprosy in Canada, and give some idea of present conditions, as I have seen them. It is the real clinical leper in whom we are particularly interested, and I leave to your leisure a sufficiently abundant literature on the laboratory aspect of the subject. Your clinical experience in general warns you that there is but one way to learn of disease,—from its unfortunate victims. And so my object will be not so much to add to your knowledge of this subject, as to arouse your interest and direct your attention whither you may gain practical knowledge for yourselves.

Our information concerning the early history of leprosy in Canada is somewhat vague in detail, but the main fact that the first cases appeared in 1816 among the Acadian people of Tracadie, Gloucester Co., N.B., seems beyond reasonable doubt. When, however, we seek the origin of the infection such a maze of theory and conjecture at once presents itself, that the inadequacy of tradition becomes painfully apparent.

Treating all explanations of origin based upon such predisposing or accidental concomitants as heredity, climate, diet, etc., at their modern valuation, we come down to consider seriously whether the first bacilli were imported from France or elsewhere by the French themselves, or whether they were accidentally sown there by strangers, as has so often happened in a maritime community.

The former view, I believe, prevails. It is plausible on the surface and may be true; but there seems so unmistakable a substratum of improbability that the matter will at least bear discussion. Is it possible that these people brought the disease with them and yet they were or seemed so profoundly ignorant of its nature? Possibly so. But immigration from France practically ceased half a century before the date of which we are speaking, and yet the first cases were two Acadian girls born of Acadian parentage. And so, our theory seems to fall before the facts of recorded history.

On the other hand, my friend the present medical superintendent of the Leper hospital is convinced that the disease came not from Normandy but from Norway, not through the agency of colonists but of sailors whose vessel is said to have been stranded on the shore of Bay Chaleur in the autumn preceding the outbreak. According to him, two of these men spent a whole winter with the family in which the first cases of leprosy appeared in the following summer. If we accept this piece of

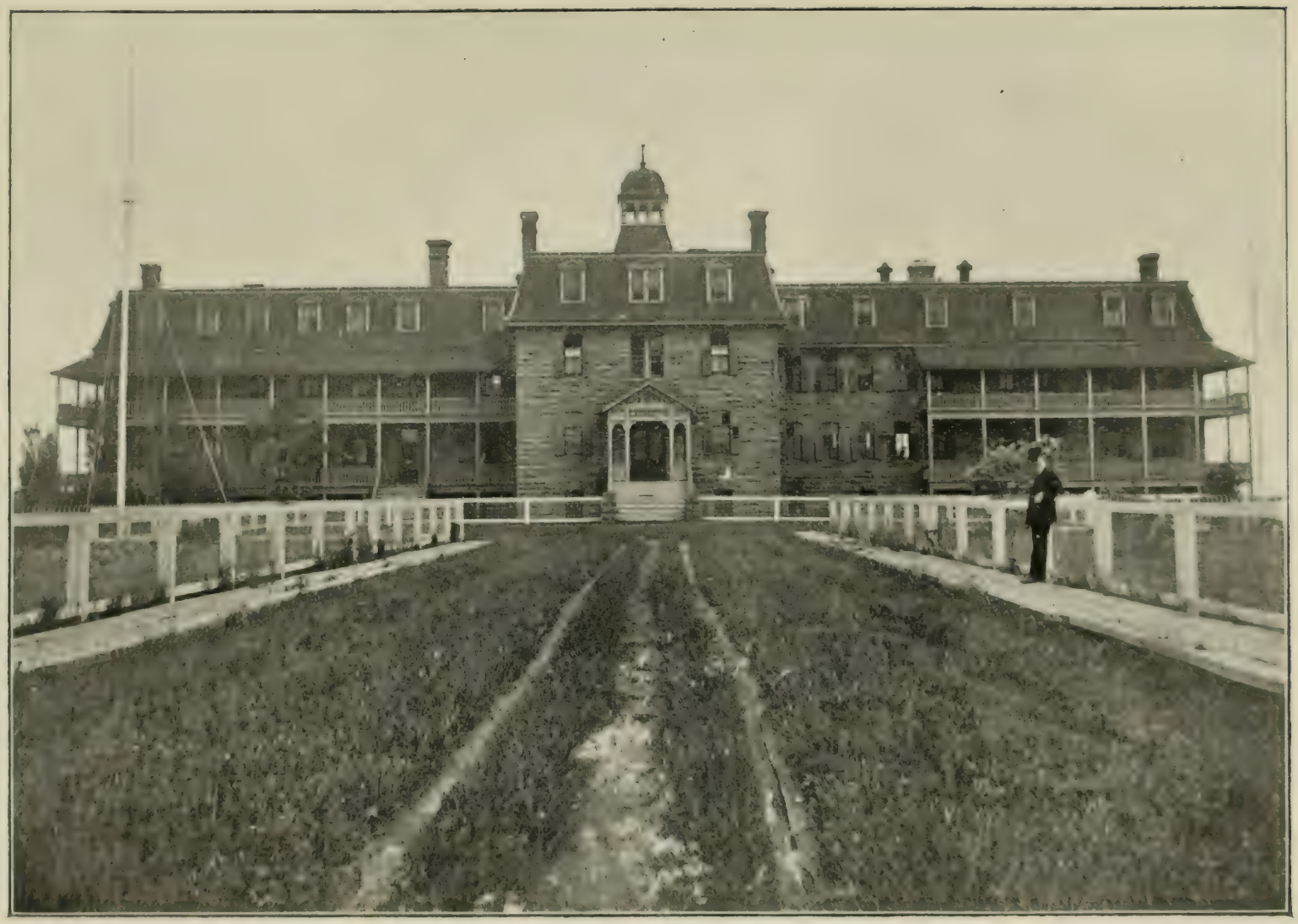
tradition, we have fairly strong circumstantial evidence; if we reject it, then we may never claim to know the origin of Leprosy in Eastern Canada.

From two cases developing in rapid succession in the family mentioned above, the disease spread slowly and in its own peculiar selective manner,—usually one, rarely more than two members of a given family becoming affected. It never invaded the inland settlements to any extent. The earliest medical attendant on the scene diagnosed the condition as closely akin to scurvy as it existed in England, but modified by the climate, and aggravated by the inferior food in common use.

Thus events held the natural tenor of their way for nearly thirty years, when a stranger is said to have recognized and reported the condition. Investigation was at once made, and as a result an isolation hospital was established on Sheldrake's Island at the mouth of the Miramichi River, and an attempt was made to gather in all cases that could be found.

Strange to say, the scheme was met with total indifference or active opposition by those in whose best interests it had been inaugurated. Twelve sorely discontented patients in all were housed at this hospital, and the superintendent modestly admitted that probably a much greater number were still at large. Four years after its founding, this Sheldrake Island Hospital was burned by the lepers themselves, as the surest means of regaining their freedom.

The story of these early events, unimportant in themselves, serves to illustrate the usual insidious invasion and spread of the disease, and the difficulties that might even yet be expected to arise in some quarters from a resort to active interference. Grant that the whole problem is one for the State and has beeen assumed by the State; grant that the danger of infection to otherwise healthy Canadians does seem minute; yet, above all there arises a very definite field of duty and responsibility for the medical profession at large. We have now more than ever before to contend with a menacing tide of European immigration from lands where leprosy is by no means unknown, and cases are not wanting at the present time where these foreigners have eluded the vigilance at our borders or developed symptoms after their arrival in the country. In dealing with this class especially, it becomes the medical man to be ever on the watch and to be sure of his ground, unless we are to have repetitions of the train of woes following an unrecognized case as has been related of New Brunswick; or have the brunt of our ignorance fall on hapless individuals suffering from minor skin affections, as happened in some cases in British Columbia.



LEPROSY HOSPITAL.

After the burning of the first Leper Hospital, much discussion arose as to the advisability of attempting to establish another similar institution. Among the usual champions of public economy were to be found the mass of the medical profession, who seem to have been practically unanimous that leprosy was an hereditary disease and consequently not to be checked by legislation aimed merely at the affected individuals. And the distribution of cases in Tracadie seemed to bear out their argument in a wonderfully convincing manner. Cases could be cited where a leper husband or a leper wife had lived and died with his family without other members developing the disease; or there might have been one leper child in a family, which was usually large, numerically, and no others showed symptoms of infection.

Fortunately, wiser counsels prevailed. Not only was a new hospital erected, but a change was made which wrought wonders in the line of improved public sentiment. The building was erected at Tracadie, so that patients were placed on terms of the easiest communication with their friends. The terrors of isolation faded so rapidly away that the medical attendant was able in his first annual report to make the flattering statement that patients had voluntarily presented themselves for examination and entered the hospital without objection. From that time our present system may be said to date, though the full idea of isolation could not be carried out until the present building, equipped after the manner of a modern hospital, was built in 1896.

But a history of leprosy in Canada would hardly be complete without a word concerning the colony which once existed in British Columbia. Some years ago the inmates of this Institution were re-examined by Dr. Smith, now in charge at Tracadie. Several patients were found to be non-leprous and were allowed their freedom. The remainder, being of Oriental extraction, were returned to their own country, where thanks to the hospitality of His Celestial Highness and our own generosity, the survivors are still maintained at our expense.

The visitor to the Lazaretto usually takes a light breakfast and prepares himself mentally for repulsive sights, — almost unrecognizable masses of human remains still clinging to a fluttering thread of existence. Then, he is apt to express himself as disappointed,—meaning of course that he is most agreeably surprised. As he passes from one to another, each rises to attention, and does his best to answer questions regarding subjective symptoms, past and present. If it is fine weather, perhaps half the total number of patients would be seen on such a visit. But where are those lepers of which I had read even recently to prime

myself for the occasion? Here, on the strength of expert diagnosis, I have seen and examined some ten cases of leprosy; but according to my text-book notions I have seen but one leper in the series,—an old lady with leontine facies in the last stages of the disease.

But the casual visitor, disabused of extravagant ideas of distress, is apt to carry away equally erroneous ideas in the opposite extreme. The worst cases are least in evidence in the wards. You have seen but half of the cases, the others have just gone out;—you go out and they will just have gone somewhere else. Surprise them in some quiet retreat, and you may after a time gain a limited amount of confidence and see ravages of B. Lepra which quite surpass ordinary text-book illustrations. Perhaps this confidence will unearth another interesting feature—the mental condition of the patient. As a rule they are shy,—some are philosophical enough, but in most there is a marked degree of mental depression. Science has in no way mitigated in his mind the traditional almost hereditary horror of a leper. Practically he ranges himself in the category of criminal convicts rather than with the unfortunate victims of disease. With a touch of sympathy for their sad plight, one is impressed with the encouraging results of active measures in respect to this disease. Unfortunately, one need not go far to see the results of inaction in respect to other kindred germs—the B. Tuberculosis or the Spirochæte Pallida.

From the series of cases now at the Lazaretto it is easy to point out two cases of tubercular leprosy, several of anæsthetic leprosy, the remaining overwhelming majority are mixed in type. The one, a man twenty-five years of age, first developed symptoms five years ago. His complaints then were weakness and general malaise, but no definite pain in any part. A little later, some patches of discoloration appeared on his face, and these and other areas, especially on the brow, became thick and anæsthetic. Similar smaller nodules appeared on the ulnar aspects of his wrists and hands. From time to time some of these masses break down and a slight discharge results in a thick yellowish scab. More recently his sight has become affected, and white pearly masses can be seen in his left eye. His hands are edematous and fingers pointed, showing atrophy of the distal phalanges. Mentally he is bright, indeed he is rather witty. In form, his case is similar to that of the old lady mentioned above, but he represents an earlier stage—the typical facies is in process of development.

In these tubercular cases the symptoms are very definite, and the course is comparatively rapid, especially in the young. If they do not succumb to intercurrent disease, the viscera become involved—the kid-

neys, lungs and the digestive tract. The beginning of the end is commonly marked by symptoms of pulmonary tuberculosis, nephritis, and intractable diarrhœa. It is said that the early cases which appear in a locality are often of this type, and that the milder anæsthetic cases occur more frequently as the disease becomes endemic.

There is an old man now in the hospital who some ten years ago was affected with what he thought to be rheumatism. The ungual phalanges of his fingers and toes became distorted and shrivelled. He has since felt an indefinite numbness in his hands which, however, did not incapacitate him for work. About a year ago his sight began to fail and he came up for examination, only to be told that he had a mild form of anæsthetic leprosy. He is hardly convinced as yet that such is the fact, and earnestly sought my opinion of his case.

A a rule, the ear-marks of past attacks of the disease are to be found on the hands, face, and eyes. The hands are affected variously in detail, but it all amounts to either atrophy or disintegration. It is remarkable how regularly the ungual phalanges only are affected; — atrophied, seeming to come to a point at the tip; or distorted, forward or laterally, or what is most common, they have disappeared altogether. Then the striking feature is what a neatly and completely healed stump remains. But a valuable point in differentiating is, that while the surgeon rarely leaves the finger-nail, in B. Lepra amputations that appendage is often found on the end of the stump, showing that the skin was not the seat of the disease.

While the eye is regularly affected in both forms, there are important differences in the modus operandi. In tubercular cases, the impairment of vision comes early, due to formation of tubercles on the cornea: in the anæsthetic cases, the patient usually enjoys good sight until the late symptoms begin to appear. The lesion then is optic nerve atrophy without noticeable changes in other structures of the eye.

Individual cases may show some striking local lesion. In one there was ectropion due to tubercular infiltration of the palpebral conjunctiva of the lower lid; in another there was general involvement of the mucous membrane of the mouth with profuse salivation. Cerebral symptoms seem common. One old man, blind and demented, was usually engaged in soliloquy; another was maniacal with homicidal tendencies, and had to be closely guarded.

There are now eighteen known cases of leprosy in Canada—and we trust that all cases are known. Of these, thirteen are probably traceable to the original infection,—the remaining five are foreigners. Two of these five, mother and son, were found in Nova Scotia, having come from

the West Indies. Manitoba furnishes another two, Icelanders by birth; and the fifth is the Doukhobor boy who came under observation some two years ago.

Information regarding the incidence of the disease in families I am unable to give. Among the laity the opinion still prevails that leprosy is hereditary, and this at foundation is the reason such data are carefully withheld. Many of these patients have relatives not far away, and to disclose their identity might react unfavourably on the present happy state of public co-operation which the Hospital enjoys, and which is so absolutely essential to the welfare of the movement.

Obviously the treatment of leprosy is prophylaxis, which again emphasizes the importance of early diagnosis. In the Lazaretto, two wards are for leper patients only, and their wants are administered to by a devoted band of Sisters of Charity under the direction of the Medical Superintendent—an appointee of the Federal Government. The care of patients in hospital is largely routine hygienic and dietetic measures, with one very essential adjunct—employment. Before many of these unfortunate individuals there is a fairly long but hopeless life, to be spent in confinement. The fullest freedom of the grounds is accorded, and outdoor exercise encouraged. Attempts to escape, or acts of insubordination are exceedingly rare; yet the possible dangers arising from the unoccupied mind or the idle hand are thoroughly understood.

Of the therapeutic agents, Chaulmoogra Oil alone deserves mention. Used internally it checks the acute symptoms, and as a dressing promotes the healing of leprous ulcers.

As I remarked in the beginning, I have probably succeeded in adding nothing of value to your knowledge. There is but one way to make such addition, and to that way distance, it is true, offers some obstacles. But here difficulties end. On the scene, you have before you our most complete triumph over any disease. Is it worth your while? I am sure I do not know what your time is worth; and if you refer to financial gain, I may say that I know of nothing offering more doubtful returns. But if you ask whether you would be likely to see and learn enough of this ancient and now well-understood disease to satisfy your simple desire to know, to enable you to fulfil your responsibility to the community, and safeguard your own welfare, then I unhesitatingly say,—It is worth your while. Visit the Lazaretto, learn all you can from the lepers whom you will find kindly disposed, and cultivate the acquaintance of the Medical Superintendent who is kindness itself.

VALUE OF THE X-RAY IN THE DIAGNOSIS OF RENAL AND URETERAL CALCULUS.

BY

F. M. AULD, M.D.,

Montreal.

In the preparation of this paper the aim has been to ascertain to what extent positive diagnosis of calculus was possible before the introduction of the X-ray. Following on this a careful search has been made among the important periodicals of Europe and America for evidence and statistics showing the place taken by the X-ray since its introduction as an aid to diagnosis in renal surgery.

The operation of Nephrolithotomy was[1] introduced by Mr. Henry Morris in 1880. Between this date and 1898 when he delivered his Hunterian lectures he performed[2] ninety-four operations for renal calculus. In these ninety-four (cases) he failed to find a stone in[3] forty-four or more than 46%. This is a very high percentage of error. Since Mr. Morris first introduced the operation he probably had a larger series of cases than any other operator during the period mentioned (i.e. 1880-1898), but we shall see later that no other operator was able to reduce the percentage of errors.

To make our ideas definite, we shall glance at the cardinal signs and symptoms of Nephrolithiasis and try to estimate their importance. The classical signs of calculus are usually said to be pain, renal colic, and hæmaturia, and at a later stage perhaps pyuria. Pain is not very definite evidence of a renal stone because it may be referred to various parts of the body. Thus most surgeons can recall instances where the pain suggested acute gastro-intestinal disturbance, biliary colic, appendicitis, or the pain may even be referred to the opposite side from the one affected.

On the other hand there are several kidney conditions having symptoms identical with those of calculus. Such are kinks in ureter, neoplasm into which hæmorrhage has occurred, hæmorrhagic pyelitis and most important of all tuberculosis. Thus C. T. Holland, of Liverpool,[4] cites a case where the symptoms were typically those of a stone in the kidney. Operation was performed but the surgeon found no stone, instead he got a typical tubercular kidney.[5] Another case cited by the

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[1] A. D. Bevan.—Annals of Surgery, 1901.

[2] H. Morris.—Hunterian lectures and J. E. Smith.—Chic. Annals of Surg., 1, 1904.

[3] H. Morris.—Hunterian lectures and J. E. Smith.—Chic. Annals of Surg., 1, 1904, and R. Abbe,—N. Y. Ann. Surg.

[4] Lancet, June 2, 1906.

[5] Lancet, June 2, 1906.

same surgeon was a girl of nineteen years. The only symptom she ever had was persistent pain in the back and loin of the right side. Appendicitis was diagnosed, operation was advised and performed but the organ was perfectly healthy and the symptoms persisted. A second operation was now undertaken for suspected stone which was found and removed. The same author [1] cites cases where the wrong kidney has been operated upon for suspected stone but where the symptoms were vague. Similarly the kidney has been suspected and cut down on when the ureter was at fault and *vice versa.*

Thus far the evidence goes to show how indefinite and unreliable the symptoms are: and later on it will be shown with illustrative cases that not only are the symptoms and ordinary methods of examination inconclusive but where stone was correctly diagnosed and operated, the operation was often incomplete because of the presence of two or more stones which could not be detected readily and were never suspected after the finding of one. Many instances of this kind have been recorded, as we shall see later.

Palpation does not afford us much aid except in rare cases. It is very rare indeed that a single stone can be felt: or that one gets the sensation of grating when two or more stones are present. In occasional cases a stone if in lower ureter may be palpated by the rectum or vagina. Tenderness over the kidney if associated with subjective symptoms has some value but is inconclusive.

The following quotations from well-known surgeons will serve to show how ineffectual are the ordinary means of examination:[2]—"The diagnosis of stone in the kidney is very difficult. Ransohoff has collected 40 cases, in all of which the symptoms of renal calculus existed but in which exploration failed to find a stone. In fact I think there are but few surgeons of any experience with renal calculus who have not failed at times to find a stone." "A short time ago (i.e. prior to the days of X-ray) the diagnosis of renal calculus was never made till the classical symptoms showed that the pathological process had so far advanced as to render surgical intervention necessary and hazardous. At that time diagnosis of 'calculus ureteritis' was never made and many cases lost one kidney as a result of unilateral anuria, and many others died without any diagnosis than 'suppression of urine' ever being made. Many cases of imparted calculus lost one kidney because the symptoms of recovery and destruction are identical." [3]

The X-ray was first used in renal calculus by McIntyre, of Glasgow,

[1] Lancet, June 2, 1906.
[2] G. E. Armstrong, Mont. Med. Jour., Jan. 5, 1897.
[3] C. L. Leonard, (Phil.), Ann. of Surg., 1901.

in 1896, and with good results, for he demonstrated the presence of an oxalate stone. Others soon confirmed this work both in England and America. During the following three or four years evidence as to its value was slowly accumulating, but the general opinion seemed to be that only oxalate stones could be demonstrated as no technique could be devised that would show phosphates, urates or uric acid, and so its value was not considered to be very great.

During these years experimenters were earnestly at work to improve the X-ray apparatus and to devise a better technique whereby any calculus could be shown, no matter how small or what its composition might be. To Prof. Schoneberg we are indebted for improvements in the efficiency of the X-ray apparatus which are outside the scope of this paper to mention further. Working with this improved apparatus C. L. Leonard, of Philadelphia, devised a much more accurate technique. He was the first to lay down the dictum which is now the basis for accurate reading of skiagrams:—"A skiagram to be accurate must differentiate tissues of less density than the least dense calculus." That is to say, if a skiagram can differentiate the kidney itself from surrounding tissues no calculus can exist undetected, because every calculus is more dense than kidney tissue.

This principle was first announced by Leonard in February, 1902, and it marks the beginning of more accurate work in diagnosis by the X-ray. Leonard himself can differentiate the kidney from surrounding structures and maintains therefore that he can demonstrate the presence or absence of stone with almost mathematical precision. He reports a series of 320 cases with the following results:—

Presence of stone diagnosed in 93.

Absence of stone diagnosed in 227.

The cases where a positive diagnosis was made were divided as follows:—

Stone found at operation in 42 cases.

Stone passed spontaneously by urethra in 26 cases.

Refused operation, 2 cases.

Symptoms too mild to need operation, 23 cases.

In the case of patients where a negative diagnosis was made the symptoms cleared up in most of the cases, but in four cases they persisted with some severity, so that operation was performed and stones found. Thus, so far as the cases could be followed, the total error was four cases in 320 examined, or 1.25%. In the matter of these cases it was afterwards learned that one error was due to the plate being in bad position so that the shadow was not thrown on it at all, and in the other three the

shadow appeared, but owing to its small size and faulty reading of the plate it was overlooked. In this series of cases one stone was plainly shown as small as one grain in weight and one stone was shown at three different levels on successive occasions.

These results secured by Leonard are pretty well confirmed by other workers,—some getting better results and others not so good.

L. B. Harris in the *Australian Medical Gazette* reports a series of 328 cases. Of these 50 gave a positive diagnosis and 278 were negative. At operation, 7 of the 50 were found to have no stone. We are not informed of the results in the cases where no stone was diagnosed. If the sum total of error was 7 cases we have an error of 2.25%, which is higher than Leonard's by 1%; but is, however, not large.

Kumnel and Rumpel report 18 cases where the diagnosis was positive and all proved correct at operation.

A. B. Johnson reports 125 cases in the *New York Medical Journal.* Of the series a positive diagnosis was made in 30 cases and all proved correct at operation. Of the negative diagnoses one error was made and that was a uric acid stone which the X-ray did not show. It was later removed by operation. So far as the other cases could be followed the other negative diagnoses were correct. This is an error of 1% only.

In the *Lancet* for June, 1906, C. T. Holland reports 79 cases. Twenty-two positive diagnoses were made and all proved correct by operation. Of the 57 cases giving a negative diagnosis one error was made, i.e. the X-ray failed to show the presence of a uric acid stone which later gave severe symptoms but was passed spontaneously. The percentage of error here is about 1.25%.

E. Harry Fenwick has had a very wide experience with skiagraphy in calculi of the urinary passages—having taken over 1000 X-ray photographs. His testimony is that the positive diagnosis is very accurate and that after repeated careful trials the negative is also reliable.[1] He reports a case which shows the wonderful accuracy attainable under favorable conditions. In this case he made the following predictions from the skiagrams:—

1. The kidney is dilated by back pressure, originally a hydronephrosis: now a pyonephrosis.

2. The lower pole is transformed into a dilated thin-walled cavity (a calyx) with 6 smooth calcium oxalate stones. The cortex is very thin.

3. A cyst projects on the convex border in its middle third, which will emit a quantity of inodorous pus.

4. The upper pole is also dilated but with no stones.

[1] B. M. J., Jan. 4, 1908.

5. A large calcium oxalate stone blocks the pelvis. This stone is covered with phosphatic deposit.

At operation the predictions were found correct to the letter, except that the lower calyx had 5 stones instead of 6, one being in a neighboring calyx.

Thus far the evidence has been pretty strongly in favor of the X-rays as an aid to diagnosis, but it would be unfair to omit the opinions of other surgeons whose experience has been less successful. Henry Morris said in 1900, the X-ray is of little value in diagnosing the presence or absence of renal calculi. Professors Israel and Schoneberg held similar views as a result of their experience. Walsham's experience is that it is almost impossible to find a stone by X-rays in a stout patient and in no case can one smaller than a pea be shown. A. B. Robinson:—The value of the X-ray is doubtful. It should not have the casting vote. R. C. Lucas:—The X-ray has been overlauded,—a negative diagnosis is of no value.

These views expressed by such prominent men naturally carry weight, but their importance is much lessened by the fact that in no instance was the series of cases large,—seldom more than 5 or 6, so that the experience is not sufficient on which to base a true estimate of radiography.

Now let us consider the causes of error.

All errors are referable to the operator, the photographic plate or some peculiar condition of the patient.

On the part of the operator bad technique is the most obvious cause. Thus Leonard made a wrong diagnosis because the plate was put in bad position and the calculus did not appear. Likewise, too long or too short an exposure will fail to differentiate properly between the structures to be shown.

Again, the operator may not have the necessary experience to interpret the plate correctly. Every observer has experienced this, and it is now well known that an X-ray operator must be an expert of wide experience to get good results.

Occasionally a flaw in the plate has led to a wrong diagnosis, but this may be avoided by using only the best plates or by a second sitting. The errors from these sources may be eliminated or brought to a minimum by painstaking effort, but not so for the third class of errors,—those referable to the patient.

Obesity is a great barrier in the way of doing accurate work,—some say it is impossible to be sure of the diagnosis in a fat patient.

A wrong diagnosis has sometimes been given because the stone was too small to show. Its composition too is a factor,—a pure uric acid stone of any size is hard to show.

The most difficult of all to exclude are calcareous glands or arteries and dense fæcal concretions. On many occasions these have simulated stone so closely that operation was thought necessary. The subsequent operation showed a calcareous gland or artery in the stone area, but nothing in the kidney or ureter.

Strange as it may seem errors have arisen from a button on the patient's clothing appearing in the kidney area, but this is unpardonable because the area to be skiagraphed should be free from any such cause for error.

Up to this point we have seen how inaccurate were the methods of diagnosis before the advent of the X-ray: we have also seen something of what this process can do: it now remains to formulate an estimate of its value in renal surgery.

1. It diagnoses calculus from other kidney conditions and obscure conditions of other organs. One case is [1] quoted where, in spite of a negative result with X-ray, operation was done, but a tuberculous kidney was found with no calculus. Another case is that of a woman with obscure symptoms for 12 years. Two or three uterine operations were done without relief. The X-rays showed a calculus. Its removal cured the symptoms.

2. Early diagnosis is possible where the symptoms are not otherwise severe enough to warrant operation. On the authority of C. L. Leonard it is stated that in operation after early diagnosis the mortality is 2-3%. After the characteristic symptoms have appeared with infection it is 25%. Undoubtedly in some instances serious destruction may occur in this way before the symptoms are serious enough to suggest operation for stone. Four cases in point are [2] cited by C. T. Holland.

3. It makes operation *definite* in its aim and *complete* in its results. Thus a hydronephrotic kidney would not be opened if the X-ray showed the cause to be stone in the ureter. In another case X-ray showed two calculi, one was found without much trouble, the second only after painstaking search and without the definite evidence of the skiagraph would certainly have been [3] overlooked. Numerous cases of this sort have been reported by various authors.

The conclusion of the whole question at present seems to be that the X-ray is not infallible, a low percentage of errors must always be reckoned on. But used with other means of diagnosis it is invaluable, and the nearest approach to accuracy yet obtained.

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[1] C. T. Holland, Lancet, June 2, 1906.
[2] Lancet, June 2, 1906.
[3] Bevan: Ann. of Surgery, Mar., 1901.

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MEDICINE IN CANADA.

BY

M. CHARLTON.

IV.

Before the nineteenth century medicine in Canada had but small beginnings, but it began to occupy a much more prominent position with the expansion of the country. As the population increased and the land became more cultivated, wealth and prosperity took the place of the privations of the earlier settlers. New laws were made to encourage education and immigration.

Since the English occupancy, war had twice devastated the land through the mistaken zeal of the Americans. Considering all these drawbacks in a newly settled country, medicine had made progress, and from the year 1832 we see a positive advance in medical matters in Canada, especially in Montreal. This city had been the great objective point of the American forces in the war of 1812. But after affairs had quieted down Montreal began to give promise of what it was to become

later—the centre of Canadian commerce and the centre of medicine in Canada.

The great Lachine canal had been commenced in 1817, by the removal of the first sod by the Hon. J. Richardson, the first president of the Montreal General Hospital. In the same year the Bank of Montreal was opened.

Printing, which was practically unknown in the French *régime,* is said to have been introduced into Montreal through the failure of the American invasion in 1775. When the news reached Congress of the defeat at Quebec, they sent three commissioners to Montreal to confer with General Arnold. Benjamin Franklin was one of those appointed. He brought with him from Philadelphia a French printer to establish a newspaper in Montreal by which they hoped to influence the minds of the Canadians. Two years before this, printer Fleury Mesplet had translated and published in Philadelphia the address of Congress to the Canadians. The commissioners reached Montreal about 29th April, 1776, but they soon found out the utter hopelessness of their task.

Franklin left Montreal on the 11th of May, but Mesplet, the printer, remained and established himself as a printer and publisher. He was the originator of the Montreal *Gazette,* which was, in 1778, issued as a weekly paper called "*La Gazette de Montréal.*" The first few numbers were printed in French, later in French and in English, and finally, in 1795, it appeared as the "*Montreal Gazette.*" According to his prospectus, we read: "I propose to fill a sheet with publick advertisements and other affairs, immediately concerning trade and commerce, to which will be added some diversified pieces of Literature. I dare flatter myself, as I hope, Gentlemen, you will encourage this, my feeble beginning, that you will in a short time see with satisfaction not only a great variety of Notices and Advertisements, but also a collection of facts both entertaining and instructive. I will endeavour to procure a choice collection of the Newest Pieces, and I don't doubt but this will stir up the genius of many who have remained in a state of inaction, or could not communicate their productions without the help of the Press. I will insert in the above Paper, or *Gazette,* everything that one or more gentlemen will be pleased to communicate to me, provided always no mention be made of Religion, Government, or News concerning the present affairs, unless I was authorized from Government for so doing, my intention being only to confine myself in what concerns Advertisements, Commercial and Literary affairs."

Mesplet and his editor, Jatard, did not however adhere to these re-

solutions, but sent forth a "scurrilous sheet" called *Tant pis, tant mieux*, "defaming all the King's officers and trying to throw the colony into confusion," and adding one more burden to the already overburdened Governor Haldimand.

During the winter of 1775-6, Mesplet published what is supposed to be the first book printed in Montreal, "Réglement de la Confréré de l'adoration Perpétuelle du Saint Sacrement et de la Bonne Mort."

As far as we know the first contribution to medical literature in Montreal was a pamphlet brought out in 1786 by R. Jones, descriptive of the epidemic which first broke out at Baie St. Paul. This was followed by a work on the "Use of Pure Nitric in Whooping-Cough, or Asthma," by Dr. Thomas Arnoldi—(date unknown). In 1819, John Tindall—On observations on the breeding and management of neat cattle; together with a description of the diseases to which they are liable.—Montreal. In 1812, Extracts from a report of the Massachusetts Medical Society respecting a disease commonly called spotted or petechial fever, which has within a few years been epidemic in various parts of New England.—Montreal.

Mention is also made of a work on physiology in manuscript, said to have been stolen from Dr. Wolfred Nelson. In 1830, J. F. Perreault published a work on large and small agricultural pursuits.

Before the conquest a number of manuscripts on general subjects had been written and circulated among friends. Unfortunately, these have perished. Before closing this short account of the establishment of printing in Montreal, mention must be made of one who stood prominently forth in the publishing world, M. Michel Bibaud. He was born at Côte des Neiges in 1782, and lived long enough to see the rapid development of printing in Canada. He wrote many valuable articles on the history of the times and lived his life as an honourable and useful citizen.

At this time in Montreal there was a noted group of men at the head of medicine. Among some of the best known were: F. C. Arnoldi, D. Arnoldi, B. Berthelet, O. T. Bruneau, W. Caldwell, G. W. Campbell, J. Crawford, A. Hall, A. F. Holmes, W. Robertson, S. C. Sewell, J. Stephenson.

Some of these men had already been heard of in foreign parts and more than one Canadian thesis had been noticed abroad—that of Dr. Vallée of Montreal, on Cancer, 1826, was thought worthy of discussion by the Medical Faculty of Paris.

They were men of brilliant talents who appreciated the value of a sound medical education, and as such they deserve a permanent place

in the medical history of Canada. There is no doubt that the high standard set by these pioneer medical men has influenced medicine in Montreal, and helped to give it its present status.

Two of the most important events in its medical history had already taken place in Montreal. The establishment of the first English hospital —the Montreal General Hospital—and the first medical school—the Montreal Medical Institution.

The hospital had now been in existence for ten years, and during these years it gave ample promise of the ultimate high position it was to occupy not only in Montreal but throughout the whole of Canada. With what pride must its little band of faithful workers have watched its growing usefulness. The first addition to the hospital was a wing added in 1832 in memory of its first President, the Hon. John Richardson, as one of Montreal's oldest and most respected citizens. It was resolved to perpetuate his name and connection with the hospital by building a new addition to be named after him. The public subscribed largely, and in September, 1831, the corner stone was laid. By the 7th of December, 1832, the new addition was ready for patients. With this new addition the hospital now contained 19 wards, and 160 beds.

The tablet on the wing reads as follows:—

THE RICHARDSON WING
of the
MONTREAL GENERAL HOSPITAL.
This Building Was Erected
A. D. 1832
To Commemorate the Public and Private Virtues of
THE HONOURABLE JOHN RICHARDSON,
A distinguished Merchant of this City, and Member of the Executive and Legislative Councils of the Province.
He was first President of this Hospital, and a liberal contributor to its foundation and support.
He was born at Portsay, North Britain, and died 18th May, 1831,
Aged 76 years.

The founding of a medical school in Montreal had given a great impetus to the study of medicine. Each year the school grew in usefulness, but the year 1829 saw a change; it ceased to be an independent school, and become known under the name of the Medical Faculty of

McGill University. The founders of the school gave up its identity to save the Charter of that University, and it is interesting to note that it was owing to a medical man that there was any University, for if it had not been for the untiring exertions of Dr. Stephenson, who, when others were indifferent, worked with such energy that he secured the bequest of James McGill for a college, when his will was being almost successfully put aside by his heirs. From that time to the present, it has been the leading Faculty in the University, making the name of the University known far and wide through the names of its teachers, "composed as it always has been of men ranking among the first in the profession." The Medical Faculty has every reason to be proud of the long list of names of its staff, men who set the love of their profession before the gain of money, and it was a common occurrence for them to help out the meagre income of their Faculty from their private means.

As Dr. Osler has expressed it, "faithfulness in the day of small things may be said to have been the distinguishing feature of the work of the Faculty in these early days. The lives of the senior members taught us youngsters the lessons of professional responsibility, and the whole tone of the place was stimulating and refreshing." Again the testimony of Sir William Dawson, in his address at the Semi-Centennial—"They were able and good lecturers, fit men to make the beginning at such kind of work," and then he mentions the names of Drs. Holmes, Campbell, Hall, Bruneau and Fraser, etc.

The first session of the Medical Faculty of McGill took place in the winter of 1829-30. In the session of 1830-31 the students of the Medical School formed themselves into a Medical Society, and this was the parent of the present fine society that the students now possess. It seems strange that during all these years the students should not have had a journal of their own. Some years ago the matter was brought before the undergraduate body and the advisability of starting a journal suggested. The proposal was enthusiastically received. The late Dr. James Stewart so approved of the idea that he spoke to the students at one of their meetings offering his support to such a scheme. The first diploma was issued by the Medical Faculty in 1833. to E. M. Logie. It is not on parchment but on ordinary paper, the size of foolscap, and written in the neat, legible handwriting of Dr. W. Robertson. The diploma was recently presented to the Medical Faculty by the grandson of Dr. W. Robertson, the late Angus Hooper, Esq.

Before the year 1833, the Medical Faculty moved from its first quarters, No. 20 St. James street, to a larger house in the same street,

which stood between the Bank of Montreal and the Cemetery. The school remained there until the year 1843. The winter course lasted from November 2nd to the first week of April, a term of about six months. Five lectures per week were given, and two lectures a week in the Clinical Course.

THE

Montreal Medical Journal.

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A NARROW ESCAPE.

Dr. Guy Johnson writing privately from Campas, Sonora, Mexico, to a surgeon in Montreal, mentions a case in which the patient had a narrow escape from death. The circumstances are so unusual that we venture to note their occurrence in the words of the letter.

"A man was working with a hand-drill at the bottom of a shaft 120 feet deep. While working there, the man operating the hoist for a huge water-bucket weighing about 250 to 300 lbs., left his work to get a drink. The bucket went down the shaft and fell on the man at the bottom. It struck him on the left shoulder and back, but did *not bruise him.* It forced him down on to his drill, a steel about 1½ inches in diameter, the head of which had been mushroomed to about 2½ inches by constant hammering. The head of the drill entered in the Episternal notch, exposing the trachea, passing to the left side of the trachea. Forcing the vessels outwards, it passed downwards and outward through the pleural cavity, forcing the lung down and smashing the fourth rib about four inches to the left of the spine; then shoving the scapula outward, it came out through his back.

"The foreman, being a fool, pulled the drill out, but instead of pulling out the pointed end, he pulled the mushroom head back again.

"I had to ride 25 miles to see him, through some of the roughest country I have ever travelled, and when I got there, the man was not suffering from shock. Pulse 80, strong and regular. Breathing deep

and regular, 28. Temperature, 97.4°. He had not lost much blood and there was no blood froth in his mouth. I rapidly cleansed and packed the wounds and had him transported on a stretcher to my house, 25 miles. It took 12 hours to carry him in, so I waited a few hours to let him rest. Then I performed a thoracotomy, removing about 1½ inch of the ninth rib and let out about a pint of bloody fluid.

"Next day he had a dry pleurisy, and since then he has been having a temperature of 99-101. There is very little purulent discharge from the original wounds and the lung is expanding well. To-day is the seventh day since the accident. His breathing is rapid, 30 to the minute, and painful, due partly to the pleurisy and partly to the tubes I have in the wounds. His pulse ranges from 80-100. I believe that eventually he will pull through."

OBSTETRICS IN CHINA.

Some nine years ago, Dr. D. J. Evans published a manual of obstetrics for students and practitioners in Messrs. Lea's series. The book was well liked, and in its newer editions is still popular. We have just been favoured by the receipt of a translation of this work in Chinese by Mary W. Niles, M.D., of Canton, published in Shanghai in 1908. We must be content with recording the occurrence and congratulating Dr. Evans upon the celebrity to which his book has attained. We are unable to offer an authoritative opinion upon the accuracy of the translation, but hasten to add the one item of evidence which we were able to secure. Two familiar forms of bandage are described by the hieroglyphics T and Y, though it does not appear which country can lay claim to priority of discovery of these useful devices. This book will prove quite as useful for English speaking students and practitioners as many others which are specifically issued for their instruction.

UTERINE CANCER COMMITTEE.

We have received for publication the following appeals to the medical profession and to midwives and nurses respectively, with reference to the early recognition of cancer of the womb.

The circumstances which led to the preparation of these appeals are briefly as follows:—At the Annual Meeting of the British Medical Association at Exeter in 1907 the Section of Obstetrics and Gynæcology adopted a resolution requesting the Council of the Association to appoint a committee to consider the best means of disseminating knowledge of the importance of the early recognition of uterine cancer. That

committee presented a report which was considered and generally approved by the same Section of the Annual Meeting of the British Medical Association in Sheffield in 1908.

At its meeting on April 28th, 1909, the Council of the British Medical Association approved for publication the appeals to medical practitioners, and to midwives and nurses, and directed that they should be communicated to British and colonial medical and nursing journals.

The attention of all Medical Practitioners is directed to the necessity of emphasising the curability by operation of uterine cancer in its early stages.

The adoption of a more extensive operation by the abdominal route has made it possible to deal successfully with cases hitherto regarded as inoperable, and to remove more of the pelvic cellular tissue as well as a portion of the vaginal walls; it is in these situations that recurrence is prone to develop.

Many patients now present themselves for examination and treatment when the disease is considerably advanced, and it is hoped that by a wide-spread and accurate knowledge of the early signs and symptoms the number of such patients will gradually diminish.

Special attention is directed to the following:

1. Cancer of the uterus is at first a local disease.
2. Cancer of the uterus is often a curable disease.
3. Operation is the only satisfactory method of treatment.
4. The earlier the disease is recognised the more hopeful are the prospects of treatment.
5. The risk of operation in early cases is slight, and the chance of permanent cure is good.
6. The recognition of early cancer is not usually difficult, and the disease should not be overlooked by the medical attendant.
7. A medical practitioner who fails to make a physical examination of a patient exhibiting any of the symptoms of uterine cancer incurs grave responsibility.
8. Treatment of symptoms without a physical examination is unjustifiable.
9. Early cancerous ulcers should not be treated with caustic; their appearance becomes masked, and valuable time is lost.
10. It is an error to wait and observe in order to arrive at a diagnosis.
11. In doubtful cases a diagnosis must and can be made in a few days.
12. To examine, to diagnose, and then to treat, should be the rule in all cases.

Symptomatology.

Uterine cancer is at first a painless disease which does not affect the general nutrition.

The early symptoms of cancer are: — Irregular bleeding of any description, even if there be only traces; bleeding post coitum; and watery, blood-tinged discharge. There may be no loss of strength or wasting, nor any condition to alarm the patient. Pain, wasting, profuse bleeding, and foul discharge, indicate advanced disease.

As the majority of cases occur between the fortieth and fiftieth year, the symptoms are too often regarded by the patient as due to "change of life." The medical attendant should not accept this assumption until he is satisfied that cancer does not exist.

Bleeding, however slight, occurring after the menopause, should give rise to suspicion that cancer is present.

Examination.

If a patient with any of the above symptoms comes for advice, a careful visual and bi-manual examination must be made before any treatment is recommended.

Should a patient refuse to be examined—and this is exceptional when the situation is explained—the medical attendant should decline any further responsibility, and no treatment should be advised. The examination should be made, even if bleeding is present, as valuable time may be lost by postponement until the hæmorrhage has ceased.

It is most important to observe rigid aseptic precautions in all manipulations.

In the examination, the condition of the vaginal portion of the cervix and of the cervical canal should be carefully noted.

In the early stages new growth may be found on the surface of the vaginal portion of the cervix, in the lining of the cervical canal, or in the substance of the cervix. Any prominence on the surface of the vaginal portion or any ulceration, *i.e.*, a definite loss of substance, should at once arouse suspicion. A nodule or nodules, hard, inelastic, or irregular in outline, felt in the substance of the cervix, suggest the presence of cancer. If the whole cervix be affected, the relative hardness as compared with the soft elastic body is pronounced.

The detection of high-lying cervical cancers and cancers of the body of the uterus is only possible after curettage or digital exploration.

The signs common to the early stages of cancer of the cervix uteri are:—

(1) The definite occurrence of new growth on the surface of the vaginal portion of the cervix, in the lining of the cervical canal, or in the substance of the cervix;

(2) Friability;

(3) Bleeding on manipulation.

(1) The definite occurrence of new growth on the portio vaginalis or in the cervical canal cannot fail to arouse suspicion. When, however, thickening of one lip or a portion of one lip of the cervix exists, the nature of the growth is difficult to determine if the mucous covering be still intact. It is then necessary to remove a portion of the affected tissue and examine it under the microscope.

(2) Friability is a sign of the greatest importance, and may be tested by the finger nail, curette, uterine sound, or an ordinary long probe. Degrees of friability exist in early cases, depending upon the amount of interstitial tissue contained in the growth.

(3) The occurrence of free bleeding after the slightest manipulation is, when combined with friability, a valuable diagnostic aid.

Forms of Uterine Cancer.

Vaginal portion of the cervix.

(1) *Infiltrating type.*—In this type, one lip, or a portion thereof, or even the entire vaginal portion of the cervix, is infiltrated with cancerous growth. Ulceration occurs early from the surface inwards, or necrosis may begin in the centre, and opening on the surface, lead to the formation of a deep ulcer, with undetermined edges.

The growth is somewhat hard in consistence, but is still friable if tested with the probe, curette, or finger nail.

(2) *Papillomatous or polypoid type.* — This includes the so-called cauliflower excrescence, and is characterised by the growth from the margin of the os externum of a rounded or flattened tumour, varying in size, which may or not have a definite stalk. It has a papillary surface, bleeds readily, and is very friable. More rarely it resembles a bunch of soft papillomata. Portions of the growth, pale red or greyish yellow in colour, are easily detachable on examination.

(3) *Superficial flattened type.*—This is characterised by a flattened growth on the vaginal portion which tends to spread over its surface. It is prone to early ulceration and is frequently seen clinically as an ulcer. The lip or portion affected is thickened. The ulcer has a sharply defined, raised edge, indented

at places, yellowish grey, finely granular surface, a moderate amount of loss of substance, and an infiltrated base. It bleeds readily on touch and the amount of hæmorrhage is entirely out of proportion to the amount of injury inflicted. The finger nail can detach small pieces from its surface.

Cervical Canal.

(1) *Superficial type.*—The inner surface of the cervical canal is lined by an irregular papillary growth which at first attacks the substance of the cervix superficially. As the growth increases portions of it may protrude through the external orifice of the cervical canal. When ulceration occurs the superficial portion of the growth is shed, with consequent hollowing out of the cervical canal, whilst the remainder of the periphery of the cervix is more or less thickened by infiltration. Where the external os uteri is narrow the process may be hidden or patency of the os uteri may be produced by destruction of its margin, whilst in uteri where the os is already wide a crater-like cavity is formed.

(2) *Infiltrating type.*—The cancerous infiltration proceeds from the mucous membrane deep into the tissues of the cervix, and thus the whole cervix becomes thickened and enlarged, or the enlargement and infiltration may be limited to one or more portions of the cervical walls. Necrosis may commence on the mucous surface, or in the centre of the infiltrated area and may lead to extensive destruction of the cervical tissues.

Probably the majority of cancer cases which are overlooked are examples of disease affecting the lining of the cervical canal or the tissues of the wall of the cervix.

Cancer beginning in the cervical canal is not difficult to detect where the os uteri is dilated as in many multiparæ. The finger passed into the cervical canal feels irregular elevations or nodules from which portions may be removed. Free hæmorrhage follows this manipulation. Difficulty arises where the os uteri is not dilated and the disease is hidden. A sound carefully passed into the cervical canal may give the impression of impinging on an irregular nodular surface, or friable tissue may be removed by the curette. Free hæmorrhage following such manipulations is a suspicious sign. Thickening and hardening of the cervix may be detected by a rectal examination, which is most helpful in detecting cancerous nodules in the cervical walls, and should always be made in such cases.

Body of the Uterus.

If the vaginal portion of the cervix, the cervical canal and the cervical walls have been proved to be free from disease attention must be directed to the body of the uterus. The uterus may not be enlarged, although a cancerous growth exists in its interior. Usually, however, there is some increase in size, which in advanced cases may be considerable.

Microscopical Investigation.

In doubtful cases, if there be a suspicious hard nodule, or erosion, or ulcer on the external os uteri, a piece including a boundary of healthy tissue should be excised.

The vulva and vagina having been thoroughly cleansed, the posterior vaginal wall should be retracted by means of a speculum, and the cervix pulled slightly downwards with a volsellum. A wedge-shaped piece, the size of a pea or bean, including *a margin of healthy tissue* should be excised with a sharp knife.

The bleeding which follows this little operation should be stilled by the insertion of one or two sutures, or by firm tamponade with a strip of gauze. An anæsthetic is not essential. The patient should be kept in bed for 24 hours.

The tissue removed should be transferred to a small stoppered bottle filled with absolute alcohol or methylated spirit, and forwarded without delay to an expert in uterine pathology.

Where the cancer originates in the body of the uterus or in the cervical canal, it is frequently possible, by using the curette, to obtain a sufficient amount of tissue for examination without the aid of anæsthetics. If this cannot be done, it may be necessary under an anæsthetic to curette the whole interior of the uterus and cervix, special attention being paid to the region of the tubal orifices. All fragments should be collected, including those which may have been washed out. The douche, if employed, should consist of sterilised water or a weak solution of corrosive sublimate (1 in 10,000), as carbolic acid and lysol interfere with the staining of the cells.

The fragments should be transferred to a stoppered bottle filled with absolute alcohol or methylated spirit.

If the expert's report is favourable the patient will be reassured, if unfavourable immediate operation is imperative.

The Operation.

The question of operation is best decided by the operator, who may require to examine under anæsthesia.

To Recapitulate.

(1.) Attend to all symptoms suspicious of cancer, and instruct the patient on their importance;
(2.) Examine immediately all cases of bleeding or abnormal discharge;
(3.) Make a definite diagnosis and do not wait for the disease to develop;
(4.) Urge immediate operation if the diagnosis is established.

The practitioner who diagnoses cancer in an early stage, when operation offers a probability of cure, renders a service to his patient as great as that rendered by the operator.

An Appeal to Midwives and Nurses in order to Promote the Early Recognition of Cancer in the Womb.

Cancer of the Womb is a very common and fatal disease in women, but *it can be cured by operation when it is recognised early.* A woman sometimes tells a nurse or midwife her ailments before she speaks to a doctor, and the nurse or midwife has then an opportunity of aiding our crusade against this terrible disease.

Cancer may occur at any age, and in a woman who looks quite well and who may have no pain, no wasting, no foul discharge and no profuse bleeding.

To wait for pain, wasting, foul discharge, or profuse bleeding is to throw away the chance of successful treatment.

The early signs of Cancer of the Womb are:—

1. *Bleeding,* which occurs after the change of life.
2. *Bleeding* after sexual intercourse, or after a vagina douche.
3. *Bleeding,* slight or abundant, even in young women, if occurring between the usual monthly periods, and especially when accompanied by a bad-smelling or watery blood-tinged discharge.
4. *Thin watery discharge* occurring at any age.

The nurse or midwife who is told by a patient that she has any of these symptoms should insist upon her seeing a medical practitioner in order that an examination may be made without delay. By doing so she will often help to save a valuable life, and will bring credit to herself and to her calling.

Reviews and Notices of Books.

Drugs and the Drug Habit. By Harrington Sainsbury, M.D., F.R.C.P., consulting physician to the City of London Hospital for Diseases of the Chest. Methuen and Co., 36 Essex Street, London, W.C. Price 7s. 6d. net.

This handsome volume was published by Messrs. Methuen on May 13th, as one of "The New Library of Medicine," edited by C. W. Saleeby, M.D. It looks and feels like a book, and not like a mass of paper and covers. It contains a great deal of miscellaneous writing, and many literary allusions, and figures of rhetoric which only the learned will understand. It is more philosophical and suggestive than informative, though it is not wanting in keen observation of which the following is an example: "The drug store is fast losing the dignity of the workshop, and is in rapid process of becoming the mere vendor's booth or huckster's stall."

The volume opens with a summary of the history of medicine which gives in 42 pages as compact and lucid an account as we have seen. The objective of drugs and the rational and psychic basis of their employment occupy three chapters. In "Ideation in its relation to treatment," and in "The Therapeutics of Pain," Dr. Sainsbury is profound without being obscure. The chapters on Habit, Control and Cure are marked by observation and reflection which ultimately become converted into wisdom in the mind of a wise man. Books of this quality, which are written by a man and not by a machine, do something to bring medicine back into life where it belongs.

Operative Nursing and Technique. By Charles P. Childe, B.A., F.R.C.S., Eng. London: Baillière, Tindall and Cox, 1909. 3s. 6d. net.

This little book upon nursing is dedicated to the sisters and nurses of the Royal Portsmouth Hospital in the hope that it may be of assistance to them in their surgical work—a hope which we believe will have its fulfilment. There are nine full page plates in the book and over 200 pages of text. The reproduction as frontispiece of the "theatre sister prepared for operating" might well pass for "the woman with the veil." It is in marked contrast, however, with the plates which illustrate the lithotomy position and the exaggerated lithotomy position. There seems to be a resemblance of features in the "surgeon prepared for

operation," and the patient who is intended to illustrate the Trendelenburg position. It is impossible, however, to identify the subjects selected to illustrate the two positions first mentioned. Figure 9, which shows the theatre nurse lifting cotton wool from a covered sterilized tin, is an alluring picture but does not add much to the informative value of the book. Possibly the book would have been equally valuable if all these pictures had been omitted.

ATLAS AND EPITOME OF OPHTHALMOLOGY. By PROFESSOR O. HAAB, of Zurich. Edited by G. E. DeSchweinitz, A.M., M.D. Philadelphia and London: W. B. Saunders & Co., 1909. Canadian Agents: J. A. Carveth & Co., Ltd. Price, Cloth, $3 net.

ATLAS OF THE EXTERNAL DISEASES OF THE EYE. Including a brief Treatise on the Pathology and Treatment by PROFESSOR O. HAAB, of Zurich. Authorized Translation, edited by G. E. DeSchweinitz, A.M., M.D. Philadelphia and London: W. B. Saunders & Co., 1909. Canadian Agents: J. A. Carveth & Co., Ltd. Price, Cloth, $3 net.

We are under a debt of gratitude to Dr. DeSchweinitz for his translation of these two admirable works by Professor Haab, of Zurich. Former editions of these two books have been already reviewed in this journal and it is hardly necessary to add any more to what has been already written. The new edition has kept pace with the scientific advance of Ophthalmology. The notes on the Pathology and Treatment of the External Diseases of the Eye are valuable as being the result of years of close observation and study on the part of the talented author. These books cannot be too highly recommended, both to the student and to the practitioner. The beautiful diagrams impress the facts on one's mind almost if not quite as clearly as would the observation of the actual cases in the clinic. Both works as their titles imply are profusely illustrated. The illustrations are of a high order and exceedingly true to nature. J. W.

KEEN'S SURGERY, Vol. 4. W. B. Saunders & Company, Philadelphia, 1909.

The fourth volume of Keen's Surgery contains articles upon 17 different subjects and embraces 1160 pages. As usual the contributions are of rather uneven merit. The claim that the work is of international character is not well substantiated in this volume inasmuch as no article is by other than an American author.

The first chapter is on Hernia and is written by Coley of New York. It is a valuable chapter representing the results of an enormous personal experience. He agrees with Russell of Melbourne, that all the inguinal and many of the femoral herniæ occur into a perforated sac. In treatment he advocates warmly the Bassini operation for the inguinal variety. He is against local anæsthesia except in cases in which a general anæsthetic is dangerous. The illustrations, most of them original, by Fry, are excellent and a good bibliography is appended.

The lesions of the rectum and anus are taken up by Abbe, of New York. At some points the chapter shows evidence of hasty writing, as indeed do many of the other articles written by busy "authorities." There is an inadequate description of metastases in rectal cancer and likewise of its operative treatment.

Edsall writes a chapter upon the examination of urine in relation to surgical measures. It is valuable, authoritative and scholarly. The chapter on the kidney, ureter and adrenal glands is written by Ransohoff of Cincinnati. Unlike most of the moderns he believes in the segregator for routine practice. He supports Tuffier's conservative position with regard to nephropexy; he is most conservative with regard to Edebohl's decapsulation operation; he gives an insufficient discussion on the pathological site of malignant tumours of the kidney, but as a whole the article is very well written and one is pleased to find the evidence of wide reading and proper digestion of the literature. Branchford Lewis of St. Louis writes upon the bladder. What he says is decidedly better than how he says it. Cystoscopy and uretero-catheterization are naturally well described, coming from such an authority as Lewis. The article on stone in the bladder is from the pen of A. T. Cabot of Boston; he advocates the litholapaxy as an operation of choice—Bigelow and Boston! He does not describe at all the perineal operation for stone.

Perhaps the best chapter in the book is that by Hugh Young of Baltimore, on the prostate, and one is pleased to see that he gives proper credit to the work of the French school, particularly Proust and Alberran. Among much that is original one notes particularly the advice, based upon personal experience, to treat persistent retro-urethral fistulæ by the addition of suprapubic drainage to the plastic operation. It is pleasant to find in a textbook such a piece of justifiable polemics as that in which Young gives the credit of priority in suprapubic prostatectomy to Fuller and disposes in one concise and cutting paragraph of the so-called "discoveries" of Freyer. It is not only that the chapter is full of the evidence of a large first half-knowledge but also that it is written in really good English—this is what pleases.

The chapter on lesions of the penis and urethra is written by Horwitz of Philadelphia; that on the scrotum, testicle, cord and vesicles by Bevan of Chicago. The section on the surgery of the intestines was written by van Hook and Kanaval of Chicago. Here especially perhaps does one see the disadvantage of compressing so much into one volume. For instance the disorders of circulation in the mesenteric vessels, intestinal obstruction, congenital dilatation of the colon, are all given but scant space, the two last occupy a page and a half between them. It is, however, inadequate for a work of this size.

J. B. Murphy writes upon the appendix. Anything that he writes of course commands attention, and this is in many respects an able article. His views upon the general treatment of peritonitis are well known and are here well set forth. The articles upon the ear by Dench of New York, and upon the eye by DeSchweinitz are both excellent. There follow somewhat long chapters, relatively speaking, upon military surgery by O'Reilly, naval surgery by Rixey (an excellent and well illustrated chapter), on surgery in the tropics by McCaw, and on the influence of race, age and sex in surgical affections by Rodman of Philadelphia.

As a rule the volume is not so good as some of its predecessors, but nevertheless contains a vast deal of useful information.

E. W. A.

Medical Reports of the Central London Throat and Ear Hospital, Vol. 1, 1909. London, England: Adlard and Son.

Under this title a small volume has been received for review. Warm praise must be bestowed on the editors for bringing forward much valuable material in a compact and interesting form. In a large special clinic there are always many cases which although perhaps not worthy of individual publication form very instructive reading if edited by a competent critic.

In the first two articles, Dr. J. Dundas Grant has been the most fortunate, both as to the form of his contributions and the interest of the subjects discussed. In the first article he discusses the question of retaining the matrix in operations for cholesteatoma of the middle ear and the matter is clearly set forth and illustrated by case reports. We regret to find no mention of Prof. Siebenmann, of Basel, who is the originator of this method. Siebenmann has pointed out that the danger of cholesteatoma is not due to any invasive character of the matrix, but to retention and increased pressure in a cholesteatomatous cavity. When the cavity is freely exposed and kept clean and dry the matrix assumes a form which makes it an ideal lining for the cavity.

Dr. Grant's second article deals with the question of ligation of the internal jugular vein in dealing with cases of lateral sinus thrombosis. He opposes ligation and reports three cases of recovery where no ligation was carried out. While the surgeon is to be congratulated on the result it lacks value from his failure to state whether other cases were operated on unsuccessfully by this method during the ten years covered by the case reports, or to give his results by other methods. The high mortality of laternal sinus thrombosis is too well known to require comment. The best results of a series so far published are those of Alexander of Vienna, who got 78 per cent. cures in a series of 32 cases, following the method of ligation in all cases.

A great deal of interesting material is reviewed by other contributors, together with brief summaries of their indications for various forms of operative interference, their methods and results. Our attention was attracted by the report of a case of adenoid tuberculosis by Dr. Abercrombie. His assumption that the condition is a very rare one is quite unwarranted. The reviewer had an opportunity two years ago of reporting a series of such cases from Dr. Birkett's clinic at the Royal Victoria Hospital and found at that time a very extensive literature upon the subject. Nager also recently reported a series of similar cases from Siebenmann's clinic at Basel.

Dr. Dan McKenzie reports some interesting observations made with a view of determining if possible the relation of artificial feeding and the use of the rubber "dummy" or "comfort" in infants to the development of adenoids and high vaulted palates. His results tend to minimise the importance of these factors as far as the question at issue is concerned though the practice is strongly condemned. The interesting question of the relation of adenoids to vaulted palate is not discussed. Dr. Wyatt Wingrave reports a mass of very interesting pathological material, including a series of brain abscesses of otitic origin. The bacteriological examinations of the ear and nasal sinus discharges have been the subject of a great deal of painstaking investigation which deserves warm praise.

We hope to see the appearance of further volumes to carry on the good work started by Vol. 1.

E. H. W.

A Manual of Surgery. By Rose and Carless. Baillière, Tindall and Cox, 8 Henrietta Street, London, W.C. J. A. Carveth & Co., Toronto. Seventh edition. 554 illustrations. 1908.

The appearance of a seventh edition of this popular work so soon after

the last edition speaks for itself. This book appeals especially to students, as there is no other textbook that covers the subject of surgery so thoroughly in one small volume. The reference to the practical application of Sir Almroth Wright's brilliant work on opsonins is hardly as full as one would wish. Its use in the treatment of boils is not mentioned, except a general comment on the benefit which may follow its application to conditions associated with staphylococci. In the chapter on tuberculosis one would expect that more than a few lines would be devoted to the uses of Koch's T. R. tuberculin, in view of its wide application at the present time. Beck's paste in the treatment of tubercular abscess is not mentioned. The classification of tumours is concise and easily appreciated. In the chapter on fracture the authors favour more frequent operation in the treatment of certain simple fractures of the shaft of long bones. The early use of a plaster of Paris splint in the treatment of intracapsular fracture is not referred to. The chapter on abdominal surgery is very well written. The book is a demy 8vo. of 1376 pages, with good type, well indexed and illustrated. It deservedly merits the continued approval of general practitioners and students.

J. A. H.

MIND AND ITS DISORDERS. By W. H. B. STODDART, M.D., F.R.C.P. ("Lewis's Practical Series"), H. K. Lewis, London, England. 1908.

If the volume before us had been styled a reference handbook for the general practitioner instead of a text-book for students it would have been more suitable. As the former it is well worthy of perusal, and forms a valuable work of reference, presenting, as it does, several features lacking in most of the standard works on mental diseases; as the latter it is, in our opinion, too much involved for the ordinary working student unless one who has made up his mind to devote himself to the specialty.

Generally speaking the author has adopted the classification of Kraepelin, and the chapter on dementia praecox presents as good a picture of this multiform and much debated disorder as we have yet seen. The two chapters devoted to the toxic insanities are also deserving of special praise as stating the clinical, mental features resulting from the abuse of alcohol, morphine, etc., in a brief yet very clear manner. Paranoia we should have preferred to see treated at greater length to the exclusion of neurasthenia and hysteria, which the majority would dispute as being properly included under the head of mental diseases.

The section on "some of the diseases to which the insane are specially liable" is a noteworthy feature, and one that might well be imitated,

and at greater length, by other writers on insanity. The book closes with an excellent *résumé* of the lunacy laws relating to private and public asylums in Great Britain, to which is appended copies of the various forms used in the commitment of lunatics. Were the text-books used by our home graduates similarly supplied it would be a great boon to those in charge of hospitals for the insane, that is, provided the said graduates would carefully study and apply the information furnished them.

Throughout, the volume is well gotten up, well illustrated, and has many features of interest that make it worthy of studious perusal by all those interested in psychiatry.

T. J. W. B.

Medical News.

MEDICAL FACULTY, McGILL UNIVERSITY.

Following is the list of names of students, 71 in number, who have completed the course for the degree of Doctor of Medicine in the Medical Faculty of McGill University. In addition to the primary subjects they have passed a satisfactory examination, both written and oral, in the following subjects:—Principles and practice of surgery, theory and practice of medicine, obstetrics and diseases of women and children, pharmacology and therapeutics, medical jurisprudence, practical and general pathology, bacteriology and hygiene, mental diseases, and also clinical examinations in medicine, surgery, obstetrics, gynæcology and ophthalmology and otology, conducted at the bedside in the hospitals:—

Archibald, D. W., North Sydney, C.B.; Atkinson, P. McL., Albert, N.B.; Auld, F. M., B.A., Covehead, P.E.I.; Bailey, C. V., New Glasgow, N.S.; Ballon, D. H., B.A., Montreal, Que.; Benoit, H. W., Ottawa, Ont.; Bramley Moore, A., London, Eng.; Bugbee, R. G., Ph.B., North Attleboro, Mass.; Cameron, J. R., Charlottetown, P.E.I.; Carney, M. J., Halifax, N.S.; Carrington, E. A. S., M.D., Barbadoes, B.W.I.; Churchill, L. P., Dartmouth, N.S.; Clarke, J. C., Nelson, B.C.; Cody, H. C., Centreville, N.B.; Conn, L. C., St. Catharines, Ont.; Cotton, T. F., B.A., Cowansville, Que.; Cox, C. G., Hull, Que.; Craig, D. A., Kemptville, Ont.; Craig, H. M., Kenmore, Ont.; Cron, Chas., Harbor Grace, Nfld.; Cross, C. E., B.A., Montreal, Que.; Curry, W. A., B.A., Halifax N.S.; D'Avignon, F. J., Au Sable Forks, N.Y.; Davis, D. W., Brockville, Ont.; DeWitt, C. E. A., B.A., Wolfville, N.S.; Donahue, H. F., Leominster, Mass.; Dorsey, J. W., Charlottetown, P.E.I.; Drury, W. H., Barrie, Ont.; Dunlop, F. T., St. John N.B.; Ew-

ing, W. T., Montreal, Que.; Fairie, J. A., Montreal, Que.; Foster, L. S., Providence, R.I.; Fraser, M. J., Stratford, Ont.; Funk, E. H., Rossland, B.C.; Gillis, J. J., B.A., Miscouche, P.E.I.; Greenleese, J. C., Ottawa, Ont.; Hale, G. C., London, Ont.; Hand, W. T., Montreal, Que.; Johnson, A. L., B.A., Halifax, N.S.; Kelly, C. M., B.A., Fredericton, N.B.; Lannin, J. C. J., South Mountain, Ont.; Lawrence, W. A., Lisbon, N.Y.; Lawson, G. C., Charlottetown, P.E.I.; Leys, W. M., Brantford, Ont.; Lindsay, L. M., Montreal, Que.; Maclean, C. G. G., Victoria, B.C.; McBride, W. P., Central Bedeque, P.E.I.; McCallum, J. S., Smith's Falls, Ont.; McEwen, S. C., Vancouver, B.C.; Manning, G. M., Barbadoes, B.W.I.; Miller, R. L., Montreal, Que.; Murray, J. M., Marmora, Ont.; Ower, J. J., B.A., Smith's Falls, Ont.; Palmer, J. E., B.A., Hampton, N.B.; Paterson, J. H., Almonte, Ont.; Patton, W. D., Vancouver, B.C.; Read, E. S., B.A., St. Felix de Valois, Que.; Richardson, R. W., Lisbon, N.H.; Scott, J. B., Hull, Que.; Sharpe, C. E., Jamaica, B.W.I.; Stewart, Alex., Ormond, Ont.; Smith, B. S., Boston, Mass.; Sparks, J. J., St. John's, Nfld.; Tannenbaum, D., Montreal, Que.; Taylor, T. H., Cumberland Mills, Que.; Thomson, J. O., Montreal, Que.; Turnbull, F. M., Bear River, N.S.; Underhill, T. B., Weyburn, Sask.; Walsh, J. J., Woburn, Mass.; Walsh, J. P., B.A., Quebec, Que.; Worley, E. G., Haley's Station, Ont.

The following is the prize and honour list of the fourth year:—

Holmes' gold medal for highest aggregate in all subjects forming the medical curriculum:—E. H. Funk, Rossland, B.C.

Final prize, for highest aggregate in the fourth year subjects—L. C. Conn, St. Catharines, Ont.

Wood gold medal, for best examination in all the clinical branches—R. G. Bugbee, Ph.B., North Attleboro, Mass.

Woodruff gold medal, for best special examination in ophthalmology and oto-laryngology—E. H. Funk, Rossland, B.C.

McGill Medical Society, senior prize—L. S. Foster, Providence, R.I.

Honours in aggregate of all subjects—1, L. C. Conn; 2, E. H. Funk; 3, W. A. Curry, B.A.

Following is the prize and honour list of the third year:—

Third year prizeman—Sidney B. Peele, New Westminster, B.C.

Sutherland medallist—J. H. Allingham, B.A., St. John, N.B.

Joseph Hills prize—J. R. Fraser, Lakefield, Ont.

Morley Drake prize—T. A. Robinson, St. Marys, Ont.

Honours in aggregate of all subjects—1, Peele, Sidney B.; 2, Robinson, T. A.; 3, Fraser, J. R.; 4, Park, J. E.; 5, Macaulay, A. E.; 6, Wil-

son, G. T., B.A.; 7, Clarke, T. L. E.; 8, Hepburn, W. G.; 9, Macmillan, H.

The following students, 78 in number, have passed in all the subjects of the third year, viz.; Pharmacology and therapeutics, pathology, hygiene, medical jurisprudence, clinical medicine, clinical surgery, obstetrics and bacteriology: Allen, K. W.; Allingham, J. H., B.A.; Anderson, W. M.; Archibald, D. W.; Ballon, D. H., B.A.; Barnhill, H. B.; Bauld, W. A. G., B.A.; Benner, F. A.; Black, V. E., B.A.; Booth, G. E.; Boudreau, F. G.; Bourne, Wesley; Brown, D. M.; Burton, W. E.; Cameron, J. R.; Carruthers, R. S. P.; Champion, B. H.; Chisholm, H. G.; Clarke, T. L. E.; Crease, A. L.; Cross, C. E., B.A.; Dakin, W. A., M.A.; Dunnet, H. W.; Elliott, R., B.A.; Ewert, Carl, B.A.; Fraser, J. R.; Fraser, M. J.; Froomess, L. E.; Gallagher, J. B., B.A.; Graves, C.A.; Hawkins, A. B.; Hepburn, H. H.; Hepburn, W. G.; Herbert, T. A.; Hicks, E. R., B.A.; Hutchison, G. W.; Keay, Arnold; Lavers, P. L.; Leys, W. M.; Lindsay, L. M.; Lockwood, S. L.; Logie, H. B., B.A.; Macaulay, A. E.; Mackintosh, A. E.; Macmillan, H.; Macmillan, S.; MacPhee, J. A., B.A.; McAlister, W. J.; McBurney, A., B.A.; McCracken, W. A.; McEacharn, M. T.; McNaughton, M. W.; Malcolm, R. B.; Manning, G. M.; Marchant, H. B.; Moodie, A. R.; Mundie, G. M., B.A.; Murray, M. J.; O'Callaghan, R. H. L.; Ower, J. J., B.A.; Parke, J. E.; Paterson, J. H.; Peabody, H. S.; Peele, Sidney B.; Piper, J. O., B.A.; Reed, E. H.; Robinson, T. A.; Scott, J. B.; Shillington, R. N. W.; Sihler, G. A., jr.; Sinclair, F. D., B.A.; Stewart, A.; Strudwick, H. T.; Thomson, J. O.; Underhill, T. B.; Walker, E. E. W.; Wallace, I.; Wilson, G. T., B.A.

Following is the prize and honour list of the second year:—

Second year prizeman— F. H. MacKay, Mount Stewart, P.E.I.

Senior anatomy prize—F. H. MacKay, Mount Stewart, P.E.I.

Honours in aggregate of all subjects—1, F. H. MacKay; 2, D. S. Lewis, M.Sc.; 3, H. C. Steeves, B.A.; 4, A. B. Walter; 5, Paul Ewert, B.A.

The following students, 30 in number, have passed in all the subjects of the second year, comprising Pharmacy, Histology, Anatomy, Physiology, Biological Chemistry and Organic Chemistry: Beck, S. G.; Bourne, C. R.; Davies, A. P.; Derby, L. L.; Derome, H. R., B.A.; Diaper, F. E.; Ewert, Paul, B.A.; Freeze, D. F. D.; Harrison, John; Hebert, A. J.; Houle, L. G.; Lewis, D. S., M.Sc.; MacDonald, D. L.; MacHaffie, L. P.; MacKay, F. H.; Macleod, J. S.; Malone, R. H.; Oulton, J. R., B.A.; Planche, H. H.; Rosenbaum, J. J.; Steeves, H. C.,

B.A.; Stewart, J. W.; Stone, W. R.; Sutherland, T. W.; Swaine, F. S., B.A.; Walcott, E. J. O'N.; Walter, A. B.; Webster, A. V.

Following is the prize and honour list of the first year:—

First Year Prizeman—H. W. Wade, Millis, Mass., U.S.A.

Junior Anatomy Prize—A. L. Jones, Victoria, B.C.

Honours in aggregate of all subjects—1, Wade, H. W.; 2, Robson, C. H.; 3, Nase, Philip; 4, Morris, W. G.; 5, Smith, J. A.; 6, Phillips, J. G.; 7. Wall, J. T.; 8, Crowdy, C. T.; 9, Purdy, W. T.; 10, Gowdey, W. C.; 11, Stewart, R. C.; 12, Meeker, J. E.

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EMPYEMA AND DELAYED RESOLUTION IN LOBAR PNEUMONIA.

BY

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In every large series of lobar pneumonia we can count on having a certain number of instances of delayed resolution and empyema. How disturbing these are requires no emphasis. They worry the patient, but often much more the physician. Their early recognition means much to the patient, for if empyema be recognized early, operation offers the chance of almost certain recovery with good restoration of function, while delayed recognition and late operation increase the chance of a fatal result and almost ensure some permanent damage and deformity. In delayed resolution, a prompt recognition of the condition probably enables us to carry out a treatment which promises good results and lessens the danger of permanent injury to the lung.

With a view especially to a study of the physical signs and their bearing on early diagnosis a review of the cases in the Johns Hopkins Hospital was undertaken.[1] This impressed especially on the writer the variability of the physical signs in both of these conditions as will be shown later. To those of us who are teachers the question often arises as to how dogmatic our teaching should be. Shall we state exceptions to our students, knowing how prone they are to fasten on the exception and forget the rule? Some hold that if they are taught the rules they will learn the exceptions themselves. Certainly if they get hold of the exceptions first the rules are not apt to follow. Let anyone decide as to what he would regard on *a priori* grounds as the condition of the vocal fremitus in delayed resolution and empyema and compare the findings in this series.[2]

1 A more extended account will be found in The Johns Hopkins Hospital Reports, 1909, vol. XVIII.

2 The question of complications, etc., is not discussed here; special attention is given to the discussion of the physical signs.

Incidence.—During a period of eighteen years (1889 to 1907) there were 805 cases of pneumonia in the medical service of the Johns Hopkins Hospital. Among these were 29 cases of empyema (3.6 per cent.) and 30 of delayed resolution (3.7 per cent.), showing an almost equal incidence of the two conditions. In addition there are 10 other cases of delayed resolution admitted after the attack of pneumonia was over, so that 40 are available for study.

Occurrence.—A point of interest is the number of cases in various years. This shows a much smaller number of cases in the first half of the eighteen year period. Thus from 1889 to 1898 there were 5 cases of empyema and 8 of delayed resolution, while in the next nine years there were 24 of empyema and 22 of delayed resolution. An explanation of this is not easy to give. An increase in the occurrence of empyema has been ascribed to the frequency of influenza, but the years of the great influenza epidemic show very few cases of empyema in this clinic. One striking thing is the agreement in the occurrence of empyema and pericarditis. The years with the maximum figures (1900 and 1905) were the same in each, which rather suggests some special strain of the causal organism as an important factor.

The question arises as to whether empyema should be regarded as a complication or sequel of lobar pneumonia. The study of this series suggests that the former is the rule in the majority, although it may sometimes be a sequel and arise long after the pneumonia is over. The points suggesting that empyema is usually a complication and present before the termination of the pneumonia are: (1) Its recognition during the progress of the pneumonia, as in three cases of this series, one being recognized by aspiration and two at autopsy. (2) The study of the temperature charts, which showed that in only one patient was there normal temperature for more than twenty-four hours after the termination of the pneumonia before the fever due to the empyema began. This interval was only three days and in the majority the temperature never reached normal. (3) The physical signs, if carefully followed with empyema in mind, may show changes suggestive of it at the end of the attack of pneumonia.

Etiology.—As to the real causes which determine either condition we know little. The wonder is not that empyema occurs but that it does not occur more frequently, when we remember that pneumococci are probably always present in the pleural cavity. Delayed resolution depends on the absence of the ferment action which usually liquifies the exudate and so allows its absorption. Why this is lacking we do not

know, and what is especially puzzling is why resolution may occur normally in one lobe and be delayed in another.

Age.—The figures for the two conditions are as follows:

Age.	Empyema.	Delayed Resolution.
1-10	6	0
11-20	4	4
21-30	12	18
31-40	6	8
41-50	1	9
51-60	0	1

These figures are from a clinic to which relatively few children are admitted. That advanced age was a factor in delayed resolution does not seem to be supported, although it is usually so stated. The number of the aged with pneumonia who are left to have delayed resolution is comparatively small.

Sex.—There was no striking relative difference except that the figures for males in delayed resolution were relatively higher than for females.

Color.—These show a marked difference in the relative incidence of delayed resolution in the white and colored races. There were 19 white and 10 colored patients with empyema and 17 white and 23 colored with delayed resolution. The colored patients show also a relatively high proportion of the total admissions for pneumonia. They comprise about 16 per cent. of the total medical admissions, 40 per cent. of the admissions for pneumonia, 34 per cent. of the cases of empyema, and 57 per cent. of the cases of delayed resolution. As to why this should be we do not know.

Alcoholism, cachexia and cardiac disease.—Many accounts of delayed resolution place emphasis on these as contributing factors, an opinion which is not borne out by this series. There was a slightly higher percentage of alcoholics than in the whole pneumonia series, but no instance of cachexia or cardiac disease of any moment. Only one patient had been bled during the pneumonia.

Character of the attack of pneumonia.—On the whole the impression is obtained that empyema usually followed severe attacks, but it is difficult to state this in statistics. Nor could any special irregularity be made out in the pneumonia which was followed by delayed resolution. One point of importance is as to the extent of the lung involvement. In only three cases of the empyema series was one lobe involved alone, the figures being one lobe, 3 cases; two lobes, 16; three lobes, 8; and four lobes in 2. The total lobe involvement was 22 on the right and 18 on the left.

The empyema was on the right side in 14 and on the left in 15 cases. *In every instance there was involvement of a lower lobe* in the attack of pneumonia. Turning to delayed resolution the figures are of interest because emphasis is often laid on this occurring especially with apical involvement. There was a marked preponderance of involvement of the right side in the attack of pneumonia, this being on the right side in 23, on the left in 12 and on both sides in 5 cases. One lobe was involved in 20 cases, two lobes in 11 and three or more in 9 cases. The number of times each lobe was involved in the pneumonia was, lower right 23, lower left 16, upper right 14, middle right 10, and upper left 5. The lower lobes were much more frequently involved, in the proportion of 37 to 19. There is also more frequent involvement of the right side (23 to 12 when the process was on one side only and 45 to 21 when the total number of lobes is counted). There was also greater frequency of involvement of the lower lobes (14 lower to 6 upper when one lobe only was involved, and 37 lower to 19 upper when the total number of times each lobe was involved is counted).

Taking up the *lobe involved in the delayed resolution,* we find about the same relative preponderance of the right side as was found in the attack of pneumonia (right side in 27, left in 11, and both sides in 2 cases). In 36 cases one lobe only was involved (25 right and 11 left), in 2 cases the upper and lower right lobes and in 2 cases both lower lobes. Taking the total lobes involved the figures are 31 for the right and 13 for the left side, while for the upper and lower lobes they are 27 for the lower and 9 for the upper when one lobe only was involved. There are two points which attract attention in these figures, the frequency with which the right side was affected and the rarity with which more than one lobe was involved. Why should one lobe clear and another not? One lobe only was involved in the attack of pneumonia in just half of the cases but in 36 of 40 with delayed resolution. That is, of 20 cases with pneumonic involvement in two or more lobes, in 16 delayed resolution occurred in only one of these lobes, the others clearing in about the usual time.

There is another point brought out, and this is the relative frequency of delayed resolution in the lower right lobe. Taking the total number of times each lobe was involved in the whole pneumonia series and comparing this with the number of times delayed resolution occurred, we find that in the upper right lobe delayed resolution occurred in 1 of 27.5, lower right, 1 in 16.2, upper left, 1 in 31.6, and lower left, 1 in 27.3 cases. Only one instance of delayed resolution occurred in the middle right lobe and this involved only a part of it. These figures

bring out the much greater relative frequency of the process in the lower right lobe. The upper right and both left lobes showed delayed resolution about once in thirty cases but the lower right about twice in thirty cases. It is difficult to give any explanation of the greater relative frequency of delayed resolution in the lower right lobe. The circulation cannot be regarded as having any influence, and it is difficult to understand why there should be any difference in ferment action on the two sides. Thus one patient had involvement of both lower lobes with a termination by lysis on the eighth day. By the seventeenth day the left side had cleared entirely but there was no sign of resolution in the right side. It may be suggested that the anatomical relations may have some influence, and it would be interesting to determine whether expansion returns more rapidly after involvement of the lower left than of the lower right lobe.

Taking the whole question of the etiology of delayed resolution it will be noted that the factors often given, such as advanced age, apical involvement, cachexia, etc., cannot be regarded as being important in this series. Two points stand out—the greater frequency in the colored race, and when the lung involvement is considered the more marked frequency in the lower right lobe.

Pathology.—It is not proposed to discuss this in any detail, the most important point from the clinical aspect being the character of the changes which occur and the rapidity with which they appear. There can be no doubt that every day a patient is allowed to go with empyema or with an unresolved lung after pneumonia, the greater is the danger of permanent change occurring. In the instances of empyema which came to autopsy there was evidence of marked early change; thus in one patient in whom the pleura was drained on the tenth day from the onset of the pneumonia, death occurred on the twenty-fourth day from streptococcus septicæmia and the pleura was found to be markedly thickened. In another patient, in whom the empyema was drained on the twentieth day, death from myocarditis occurred on the forty-sixth day and at autopsy the pleura was everywhere adherent, with adhesions so firm that they were separated with difficulty. Changes in the lung may also develop with great rapidity; thus in one patient dying on the twenty-fourth day from the onset of the pneumonia there was marked thickening of the pleura and decided fibroid change in the lung. Turning to delayed resolution we find that with this the development of permanent change may be very rapid; thus in one patient dying on the twenty-fifth day with suppurative pericarditis, the pleura was adherent, the adhesions showing marked signs of organization with evidence of fibroid changes

in the lung. In the second case with death on the fifty-seventh day there was a very marked increase in the fibroid tissue in the lung and the pleura also showed considerable thickening. However, so far as one can tell clinically some patients have delayed resolution for longer periods than these and recover entirely as far as ordinary examination can decide.

The lesson to be learned from the rapidity with which these changes may appear is the importance of early diagnosis. Every day that the empyema goes untreated or that delayed resolution persists increases the likelihood of permanent damage which cannot be recovered from as regards function. Another point of importance in empyema is the danger of complications. Naturally it is difficult to say whether the empyema had any special influence, yet when meningitis, pericarditis or endocarditis appears in a patient with empyema some time after the pneumonic attack the question arises as to whether this may not have been secondary to the empyema. For example, in one patient empyema was recognized on the twelfth day, at a time when the pneumonia was still extending, and operation was done on the fifteenth day; pericarditis appeared later and death occurred on the twenty-fourth day. In such a case it does not seem probable that earlier operation would have made any difference. In another case the empyema was recognized on the seventeenth day and was operated on at once. Death occurred on the fortieth day with endocarditis and meningitis. In another instance in which operation was done on the twentieth day the pleural condition was satisfactory but the patient died on the forty-sixth day with myocarditis and infarction of the lung. While it is doubtful how much effect the persistence of the empyema may have, yet there can be no question that early operation diminishes the risk of later complications, such as endocarditis and meningitis.

Symptoms.—Onset. There is very little to be said regarding this in either empyema or delayed resolution. As has been said, the study of this series suggests that empyema is usually present at the termination of the attack of pneumonia and hence the symptoms of the two will be more or less continuous. No special features such as a chill or increased pain, which might be regarded as due to the onset of the empyema, were recognized. In the majority of the cases the temperature never reached normal, or, if it did, this was only for a few hours.

In delayed resolution it is also evident that there is little to be said regarding the onset, although there is one group of patients in which the temperature falls either by crisis or lysis and the patient feels fairly well for a time, to complain later of other symptoms. When this was

the case the most common complaints were of thoracic pain, cough, respiratory distress and weakness. These were especially evident in patients who had had the attack of pneumonia outside of the hospital, recovered as they thought and then came to the hospital on account of the return of symptoms. In these patients the complaint of weakness was perhaps the most common. Some of them had gone back to work but had been compelled to give up on account of lack of strength. As regards the complaint of pain, it may be noted that sudden pain sometimes appeared during the course of delayed resolution and was generally associated with the finding of a friction rub.

It is very evident that the general picture shown by these two conditions may be much the same. There may be little change from the condition shown in the attack of pneumonia, or, as is commoner, there is some improvement for a few days, but the fever, some symptoms and physical signs persist. There may be a certain amount of distress and dyspnœa in both conditions, and the patient may emaciate, lose color and gradually become weaker. It is perhaps best to consider the various features separately.

Fever.—This was the most common symptom in empyema, being present in every patient and in only two was it slight. There are all kinds of variations in the fever course, the most common picture being a certain amount of irregularity—the temperature varying from 99° to 102° or 103°. In delayed resolution the occurrence of fever was not as constant, there being five cases in which it fell to normal after the pneumonia and remained there. As a rule the degree of fever was less than in empyema, as in the largest number it varied from 99° to 101°. The duration of fever is very different in the two conditions. As a rule it continues in empyema until the pus is evacuated, although in a few cases it declined steadily and almost reached normal, even with pus present. In delayed resolution, on the contrary, the tendency is for the temperature to return to normal. There is, however, a great variation in the duration.

Pulse.—In the largest number of the empyema cases the rapid rate during the pneumonia persisted with the complication. In 4 it fell to normal at the end of the pneumonia and then rose gradually; in 3 it was rapid during the pneumonia and then fell to normal during the empyema. In delayed resolution the rate was usually lower; in only one case was it over 120 and in the majority it was not over 100. Bradycardia occurred in 3 cases during delayed resolution.

Respiration.—This showed more constant change than did the pulse. In the majority of the empyema cases the rate was rapid, never reach-

ing normal after the pneumonia, but did not show any increase over that seen during the pneumonia. The same rapidity was noted in delayed resolution and was rather more constant, as in only 5 cases was the rate below twenty-four and in 14 it was over thirty. In one instance the increased rate persisted after the lung had cleared entirely.

Leucocytes.—An increase was practically constant in empyema, as in only one patient did they fail to reach 15,000 per cmm. This was in a patient dying on the ninth day of the pneumonia with a very severe infection. The largest number showed a count between 20,000 and 30,000; the highest count was 63,000. In delayed resolution the variations were more marked. In 7 cases the leucocytes were not over 9,000 and in 3 others not over 12,000. The largest number had counts between 12,000 and 25,000; the highest count was 50,000. It was not possible to associate the number of leucocytes with the course of resolution, the persistence of signs, or the degree of fever. Some patients showed great variations from day to day. Thus in one case, they were about 25,000 during the pneumonia and fell to 12,000 by the twentieth day; the lung cleared from the twentieth to the thirtieth day but on the twenty-seventh day the leucocytes were 27,000.

The results of this series show that leucocytosis is more constant in empyema than in delayed resolution, so that with the diagnosis between the two, the absence of leucocytosis would speak against empyema.

Sputum.—Except in the instances in which an empyema ruptured into a bronchus, the sputum showed no special features. In delayed resolution it varied greatly but as a rule was muco-purulent and tenacious. The tenacious character may persist for some time. Prune juice sputum, very foul sputum, bloody sputum, abundant frothy sputum, were all observed. One point of interest in delayed resolution is the occurrence in the sputum of casts of the bronchi, as was seen in 3 cases. In one patient a large fibrinous cast of the bronchi was brought up in the fourth week, a very unusual happening.

Physical signs.—It is to the study of these that special interest belongs, but as will be found the results are not such as to encourage the belief that typical findings are to be expected in either condition. In discussing the signs in empyema, it has to be remembered that those in empyema complicating lobar pneumonia may be very different from those in a primary empyema. The extent of consolidation, amount of lung involved, and the rapidity of resolution may all influence the signs. In delayed resolution the presence of exudation in the pleural cavity may have a marked modifying effect on the signs.

Inspection.—This does not seem of special importance as the appear-

ance of the chest and the decreased movement usually do not differ from that seen in the pneumonia. In a few instances of empyema the intercostal spaces may show slight bulging. In no case of this series was the apex beat displaced.

Palpation.—By ordinary rules we should consider the results of this to be the most reliable means of distinguishing between pleural effusion and consolidation. The findings of this series, however, showed many anomalous observations. In empyema there were ten cases in which the vocal fremitus was present although diminished. It may be said that in only one of these was the empyema encapsulated, as proved by operation, and only one was in a patient below the age of fifteen years (in children, of course, the physical signs of empyema are very variable). In two cases with wooden dulness the vocal fremitus was well marked. In one case it was well marked on the fifteenth day and absent on the seventeenth day. In delayed resolution we find the same puzzling findings. Among 32 cases with careful notes on the vocal fremitus, in 8 it was about normal, in 13 it was increased, in 10 it was definitely diminished, in one being almost absent, and in one it was entirely absent. Thus in one-third of the cases there was a marked decrease in the vocal fremitus when we should expect practically always an increase.

When we seek for an explanation of these findings, there are several points which must be considered. In empyema with lobar pneumonia, there is sometimes a consolidated lung which cannot retract and which transmits the fremitus more strongly than normal. In several of these cases at operation it was found that the lung was adherent to the diaphragm. Conditions of tension may be present which permit of the conveyance of the vibrations as is sometimes seen in a massive pleural effusion. In delayed resolution there are several possible factors. The presence of casts in the bronchi may be the explanation of the decreased vocal fremitus in a few cases; in others the condition of the lung tissue may be a cause, some cells being free of exudate while others contain it. But probably by far the most frequent cause is the presence of exudate on the pleura which may be of sufficient thickness to prevent the transmissions of vibrations. In some cases of this series there was a friction rub present at the time of the reduced fremitus.

Local tenderness on palpation was made out only in one case. There may be a certain amount of resistance made out by palpation, but this is usually better perceived on percussion.

Percussion.—In both conditions this may show but little difference from the note during the pneumonia, or, especially in empyema, it may be followed by increasing dulness and a gradual change in the character

of the note which becomes duller and more wooden in quality. Distinct movable dulness was obtained only in one case of empyema. In delayed resolution the note varied from dulness to flatness, but there was no evidence that importance could be laid on any special quality of the note. The point of greatest interest is the occurrence of *tympany*. This was obtained over the area of delayed resolution in seven cases. In one case there was tympany over the adjoining portion of the next lobe which had not been affected in the pneumonia. In one case of delayed resolution in a lower lobe there was a small area of marked tympany at the angle of the scapula. On the whole it may be said that the percussion note over an area of delayed resolution is not as dull and rarely shows the wooden quality so often obtained in empyema.

Auscultation.—The results showed much diversity and were often difficult to explain. In empyema it may be said that the most helpful signs for diagnosis were obtained on auscultation. In 5 cases no breath sounds could be heard and in the remainder they were diminished, in some distant feeble breath sounds being heard and in others distant tubular breathing. Rales were heard with the breath sounds in 4 cases. It was frequently noted that the boundaries of the area over which the breath sounds were diminished or absent were very sharp, and that moving the stethoscope a short distance gave a very different finding. But even of more value than the character of the breath sounds were the voice sounds. The commonest change was a curious nasal quality often very sharply limited as to area and boundaries, in many cases the transition to normal voice sounds being very sharply marked. Of all the means of diagnosis—except the use of the needle—this character of the sounds was the most useful.

In delayed resolution the signs showed great variation. During the period of delayed resolution feeble tubular breathing without any rales was heard in 6 cases and with rales in 11 cases. Tubular breathing of moderate intensity was heard in 6 cases, in 3 with rales. There was intense tubular breathing in 6 cases only, in 3 with rales. In 9 cases there was no tubular breathing but sounds which varied from feeble breathing to harsh vesicular sounds. When these observations were made there were no signs of clearing, unless the disappearance of tubular breathing be regarded as such. The voice sounds were usually conveyed more loudly than normal, but this bore no relationship to the character of the breath sounds.

The signs during clearing were if anything more diverse. The most common change was that the tubular breathing became less marked and rales appeared. In others rales were not heard at any time. In 9

cases the breath sounds became enfeebled during the clearing, in 5 no rales being heard. There was a great variety, in some the breath sounds becoming harsher, with or without rales, in others the change was from harsh sounds to normal ones. In some cases a pleural friction rub appeared during resolution. The occurrence of this was rather irregular, in one case being heard first on the twenty-eighth day.

Signs on clearing.—It is not always easy to say what is the first sign of resolution. As a rule some change in the percussion note was most evident. Usually the note became more resonant and often a tympanitic quality became apparent. In the cases in which fever persisted there were usually signs of clearing before the temperature dropped to normal. Of the auscultatory signs, in 15 cases the first change was that the tubular breathing became less intense, with or without the appearance of rales. In 16 cases the breath sounds became feebler and more distant. With this the tubular quality became less marked, but the feeble distant character of the breath sounds was the most striking feature. As the clearing advanced the breath sounds gradually returned to normal, but in several patients they were feebler than normal after all other signs had disappeared. This feeble character of the breath sounds is difficult of explanation. Plugging of the bronchi and increase in the pleural exudate may explain some of the cases.

Duration of resolution.—When this could be accurately estimated, from the time when signs of clearing were first evident until the lung seemed normal, the period was about ten days in 5 cases, about fifteen days in 8 cases, about twenty days in 5 cases, about twenty-five days in 7 cases, about thirty days in 5 cases and about fifty days in 2 cases.

Diagnosis.—It is evident from the study of the physical signs that there is no one which is pathognomonic and no combination which can be expected with any regularity. Early diagnosis means much to the patient in both conditions, every day an empyema is left increases the danger of a complication and makes the probable resulting deformity and pleural and lung changes more marked. In delayed resolution the early institution of proper treatment may result in complete restoration without permanent changes in the lung.

The study of the symptoms and signs shows that there is no one which is always present or which can be regarded as pathognomonic. In fact, sometimes they may be decidedly misleading, as for example the presence of vocal fremitus in empyema or its marked decrease in delayed resolution. Neither the presence nor absence of any sign can make or not make the diagnosis of either condition. How important it is, therefore, to study all the features thoroughly and make the diagnosis not from

any combination of signs but from the whole picture. Naturally it is the early diagnosis of empyema to which reference is specially made; with a large amount of exudate the diagnosis is rarely in doubt.

Perhaps the best plan is to consider all the possibilities and proceed by exclusion. Even then it may be necessary to wait, but with proper daily examination and especially not taking things for granted, the condition should rarely be in doubt very long. Seeing a patient day after day it is easy to overlook what seems so clear, and to go over familiar ground with a seeing eye seems to be sometimes impossible to the best of us. Certainly for one of these conditions—empyema—there is no excuse for the delay in recognition so often seen. The records of any large hospital will show a surprising number of cases brought in with empyema weeks and sometimes months after it should have been recognized. I heard a consultant say recently: "Why should any man have to call me in to recognize a pleura full of pus?" If we kept in mind the fact that fever after an attack of lobar pneumonia means something which should be recognized, and realized that every day a complication goes unrecognized may mean serious harm to the patient, we might be stirred up to greater diligence.

The conditions which have to be considered are (1) empyema, (2) delayed resolution, (3) tuberculosis, either co-existent with lobar pneumonia, or present as a tuberculous pneumonia, wrongly diagnosed, (4) some complication, such as abscess or gangrene, (5) a slight gradual extension of the pneumonic process, and (6) the condition sometimes termed a chronic pneumonia.

(1) *Empyema.*—As no one feature is always present, we must expect the physical signs rather to excite our suspicions than to confirm our fears. Of the physical signs, decrease in the vocal fremitus, changes in the percussion note and especially alterations in the breath and voice sounds are the most important. But it has been pointed out that decrease in the vocal fremitus may not be marked at first and that no great weight should be attached to its presence in deciding against empyema. Of all the findings probably the signs on auscultation give the greatest aid. Suppression of the breath sounds and a peculiar nasal quality of the voice sounds are of much value if found.

With this uncertainty as to the physical signs, it is evident that we should employ much more frequently our most certain means of diagnosis, the exploring needle. This should be used without any hesitation and always when there is any doubt. We should be as ready to introduce a needle as to do a blood count, and if properly done one does not involve much more pain than the other. It is well to use a small needle

because one is less likely to hesitate about using it frequently. In the early stages the fluid is rarely very thick and difficulty from plugging of the needle is rare. Aspiration should be done with the needle at varying depths. Early in the empyema there is probably only a thin layer of fluid between the two layers of the pleura and it is easy to put the needle through this and into the lung, with a negative result. This would be avoided if the advisability of trying to aspirate just inside the parietal pleura was kept in mind. The need of care to avoid any infection should always be observed. In some cases the x-rays may be of aid, but in the early stages too much should not be expected from them.

In the diagnosis between empyema and delayed resolution the absence of leucocytosis speaks against empyema.

(2) *Delayed resolution.*—This diagnosis must often be arrived at by exclusion and should be the last to be made instead of the first, as is too often done, empyema being not infrequently considered to be delayed resolution. The variability of the physical signs must be kept in mind, but one point which aids is the fact that they rarely advance as in empyema; for example, the degree of dulness does not increase. Here again in doubtful cases the use of the exploring needle is of help, and this is useful not only on account of what is obtained by puncture but especially through the information obtained by the feeling communicated by the needle entering solid lung. The use of the x-rays may be of help in some cases.

(3) *Tuberculosis.*—This may give considerable difficulty both in regard to the diagnosis from empyema and delayed resolution. As a rule empyema may be excluded by results of puncture. This is especially the case when a thickened pleura may be present with tuberculosis. The difficulty is perhaps greater in distinguishing delayed resolution. A picture of acute lobar pneumonia may be given by tuberculous pneumonia and it is only the long persistence of signs that finally arouses suspicion. Probably the tendency is rather to regard tuberculous pneumonia as delayed resolution than the contrary. The general condition may be of some aid, for generally with tuberculous pneumonia this does not improve, whereas in delayed resolution despite the persistence of the local condition the patient may improve and gain weight. By far the most important aid is the daily systematic examination of the sputum, but here again bacilli may not be present until some time after the onset; still persistent negative findings day after day must be considered as one of the most important points against tuberculous pneumonia. Sometimes delayed resolution after lobar pneumonia may occur in a

patient who has also pulmonary tuberculosis. This condition is not easy to recognize until time makes the correct diagnosis possible.

(4) *Complications* should rarely be a cause of confusion, although it is evident that abscess or gangrene might suggest empyema. This, however, is of no moment as the treatment is the same. Such complications as endocarditis or pericarditis should be easily recognized and can rarely cause confusion.

(5) If the patient has been carefully examined from day to day and accurate notes made it is not likely that a slow extension of the process will give much difficulty. The general features of the pneumonia will probably remain well marked and the changes in the physical signs should make the matter clear. In some cases the question of (6) the so-called chronic pneumonia may arise, especially in regard to delayed resolution. It is difficult at an early stage to distinguish these two conditions, for as far as physical signs go they are the same.

Prognosis.—This has to be considered both as regards life and restoration of function in the lung. Seven of the twenty-nine patients with empyema died (24.1%). Two of these died during the attack of pneumonia, and one from streptococcus septicæmia. The other four died of some complication, one of pericarditis, one of pericarditis and meningitis, one of endocarditis and meningitis, and one of myocarditis and infarction of the lung. These complications came on after the empyema had been drained, but it seems reasonable to hold that the earlier operation is done the less is the chance of them appearing. The death rate in empyema did not differ materially from that of the whole pneumonia series.

The ultimate results in the patients who recovered were good, and so far as known there was no instance of bronchiectasis or marked fibroid change. There was usually some shrinking of the affected side, but the average difference was not over one inch, with drooping of the shoulder, slight dulness and diminished breath sounds at the base. However, some patients showed no change, as one who had empyema on the right side in 1890 and returned with a second attack of pneumonia in the same lobe in 1895.

How frequently is an empyema absorbed either without interference or after tapping? There was one instance in this series in which recovery followed aspiration. The signs were rather unusual and aspiration was done on the fourth day, turbid fluid being obtained which contained pus cells and pneumococci. The aspiration was repeated the next day with the same results. The temperature fell by lysis from the eighth to the tenth day and recovery was uninterrupted. The signs over

the lung were normal on discharge. Such cases are to be regarded as exceptional and should not be used as an argument against operation.

Delayed resolution does not involve much danger to life, but there are always chances of permanent change in the lung. In this series two patients died (5%), one having empyema with pericarditis, the other endocarditis. The ultimate result in the lung may be hard to estimate. When one remembers that in one of the patients coming to autopsy on the twenty-fifth day from the onset of the attack there was definite change in the lung, the rapidity of progress of this is realized. It is impossible to be certain in any given case that some permanent change will not be left in the lung.

Treatment.—This requires little discussion. In empyema thorough drainage should be done at the earliest possible time. To wait for absorption or to delay, hoping that aspiration may be effectual, are both to be condemned. In delayed resolution it seems difficult to understand how any drugs or local measures can be of great aid. Our best aid is in the use of the x-rays. These should only be used after all signs of inflammatory progress have disappeared. It is important to exclude tuberculous pneumonia, for in case of this the x-ray treatment will do harm. For delayed resolution four exposures to the extent of four or five minutes each may be given on alternate days.

Conclusions.—The points specially brought out by the study of this series of empyema were:

1. In the majority of instances empyema may be regarded as a complication of pneumonia, rather than a sequel.

2. It occurs relatively much more often in the colored than in the white race.

3. Fever was the only manifestation always present.

4. The physical signs are variable, and it is well to remember that vocal fremitus may be retained, even with a considerable amount of exudate.

5. Of the physical signs, changes in the breath and voice sounds were the most useful single manifestation in diagnosis.

6. The importance of the repeated use of the needle in all doubtful cases.

The study of this series of delayed resolution suggests the following conclusions:

1. That the factors usually considered to be of importance as affecting its occurrence, such as apical involvement, advanced age, debility, and cachexia, did not seem to have any influence.

2. As regards age, three quarters of the patients were between the ages of seventeen and forty years.

3. The conditions which did seem to affect the incidence especially were (a) color and (b) involvement of the lower right lobe. The colored showed a relative high incidence as compared with the white race. The lower lobe of the right lung was concerned much more frequently than any other, both in the total number of cases and relatively in proportion to the number of cases in which it was involved in the pneumonic process. The cause of this is obscure, unless it be diminished movement on account of the relationship to the liver.

4. The physical signs show great variation and no general description can be given of them. This applies both to the signs during the continuance of the delayed resolution and during clearing.

5. The diagnosis must frequently offer difficulty and can often only be made by exclusion of other possibilities. Empyema and tuberculous pneumonia are the conditions which give the greatest trouble.

6. As regards prognosis, while the danger to life is not great, it is never safe to predict absolute restoration in the lung. Permanent change may appear in a short time.

7. The use of the x-rays is the most hopeful therapeutic measure, but these must always be used with caution and only after the diagnosis is positive.

METASTATIC GONORRHŒAL CONJUNCTIVITIS:—DEMONSTRATION OF THE GONOCOCCUS IN SMEAR AND CULTURE.*

BY

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We recognise to-day two distinct forms of gonorrhœal infection of the conjunctiva: (1) Gonorrhœal ophthalmia due to the direct transfer of virulent pus to the conjunctiva, (2) Metastatic gonorrhœal conjunctivitis, a form which occurs in subjects with systemic gonorrhœa, and which is due to infection carried to the eye by some internal means.

The course and results of gonorrhœal ophthalmia in infants and adults are only too well known. Bacteriology has placed our knowledge of its cause on a sound basis, thanks to the work of Neisser and Piringer. The second type has been known for many years; in fact, metastatic was the first of these forms to be recognised, and at one time all cases

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of gonorrhœal conjunctivitis were attributed to infection by metastasis. It has a characteristic clinical appearance. Early in the course of a gonorrhœa, or after some months, or during a relapse, the patient suddenly finds both eyes inflamed, with more or less muco-purulent discharge. Shortly after this, gonorrhœal rheumatism makes its appearance. The inflammation occurs among males, tends to recur, may remain a conjunctivitis, or involve other parts of the eye.

While metastatic conjunctivitis has been well understood clinically, its ætiology has been the subject of much speculation and discussion. Bacteriological work has been practised to a very limited degree, and in the great majority of cases has consisted in the examination of a prepared smear. Many of these cases, too, were reported before we were acquainted with the pathogenic conjunctival organisms and before conjunctival bacteriology had been brought to its present standard. As was to be expected, the results were largely negative, to such an extent, in fact, that the presence or absence of the gonococcus has been taken as the important point in the differential diagnosis of the metastatic from the direct infection.

If not due to the gonococcus, to what, then, shall we attribute it? According to Carroll, there are three theories. Axenfeld, in discussing Van Moll's paper at the Congress in Utrecht, in 1899, advanced the theory that this form was not due to the gonococcus, but rather to the action of the gonotoxin on the conjunctival tissue.

A second theory is that the inflammation is due to a mixed infection. That the gonococcus, or its toxin, prepares the way for the ordinary pyogenic bacteria, so frequently found in the conjunctiva, to set up an inflammation. The third theory is, that the infection is a true metastasis, that the inflammation is set up by the gonococcus, carried by the blood-vessels to the conjunctiva, as we know it can be carried to different parts of the body. The evidence in favour of this view consists in Lipski, Morax, Van Moll, Burchardt, Kurka, and Knapp having found the gonococcus in the conjunctival secretion. Whether differentiation from the other Gram-negative diplococci took place or not in these cases, I am unable to say.

The diagnosis of metastatic conjunctivitis depends largely upon clinical evidence.—E. B., a young man, age 18 years, was referred to me by Dr. C. W. Vipond, on Monday night, November 2nd, for treatment for gonorrhœal conjunctivitis. He had been under treatment for some months for gonorrhœa, but in spite of that had spent Thursday night, October 29th, in sexual excess. On Friday his eyes felt peculiar, and he

noticed they were blood-shot. During the following two days, the redness increased, and on the next evening he came to consultation.

He complained that his eyes were painful, especially the right, although both eyes had become involved simultaneously. There was no swelling of the lids, and but very slight chemosis of the bulbar conjunctiva of the right eye. Intense congestion of both palpebral and bulbar conjunctiva was present, although a ring about the corneo-sclerotic margin was of normal colour and contrasted very markedly with the rest of the conjunctiva. There was a profuse muco-purulent discharge, especially from the right eye. The whole furnished a typical picture of a severe acute catarrhal conjunctivitis of pneumococcus or Koch-Weeks' type. After examining the media, fundi, and vision, which were normal, slides were examined, and media inoculated. His eyes were then washed out with warm boric acid solution. He was given some powdered boric acid to use, and told to return the next day.

When he returned the following morning, there was no appreciable difference in the conjunctivitis, but he complained that upon arising that morning, his left big toe was so swollen and painful he was unable to put his shoe on and had a slipper on his left foot. The next day, his foot was so painful that the family physician was called to see him. His diagnosis was gonorrhœal rheumatism, and he advised removal to hospital, where the patient was admitted to the Eye and Ear ward, Nov. 4th, when the following notes were made: Patient is a well nourished and developed young man, with sallow complexion. There is at present no urethral discharge. He had had a discharge for three months, but with the onset of the inflammation in his eyes, this had stopped. There is no evidence of scar on the penis, no pain on micturition, but there is a large quantity of pus in the urine. There is marked swelling and redness of the metatarso-phalangeal joint of the great toe of the left foot, great pain on movement of the foot, and marked tenderness over the joint. The other joints of the body are normal. He has in both eyes a severe catarrhal conjunctivitis. Previous history negative. The treatment ordered was irrigation of the conjunctival sac, with warm boracic solution, with local applications to the painful joint.

Nov. 5th.—Eyes show marked improvement. The conjunctival congestion is much less, as is the discharge. He spent a restless night. The pain in the great toe was very severe, and to-day he complains of pain in the left ankle and left temporo-maxillary joints. Nov. 6th.—Eyes continue to improve. The great toe of the left foot is not so painful, but both temporo-maxillary joints are involved, and the right knee joint swollen and very painful. Nov. 7th.—Patient had a restless night.

T. 103° F. Bulbar conjunctivæ normal, palpebral shows some congestion, but is practically normal. Was transferred to-day to the medical ward. Four days after beginning treatment, which consisted only of washing the eyes with boracic solution, and eight days after the eye symptoms began, his conjunctivæ were in a normal condition. Nov. 8th.—Eyes normal. Nov. 10th.—Eyes normal. Left knee painful. Nov. 14th.—Right and left knee very painful. T. 103° F. Conjunctivitis present again in the right eye. Nov. 15th.—Eye better. Nov. 16th.—Knees very painful. Urethral discharge to-day from which the gonococcus was obtained. Nov. 19th.—Left the hospital.

The patient was seen at his home at intervals up to December 10th. Up to this time his eyes had remained quiet and his rheumatism had been steadily improving. On December 10th, however, his knees and elbows became freshly involved. His eyes became "like balls of fire" and there was again some discharge. The conjunctivitis continued three or four days, but as the rheumatism made no improvement, he was sent again into hospital, December 15th.

Since that date his eyes have received no treatment, and have remained well. The patient was seen January 3rd and again at a later date in January. His eyes had remained well and his rheumatism had progressed satisfactorily.

The diagnosis of metastatic conjunctivitis was made from: (1) The onset and course of the inflammation. (2) The absence of clinical signs of exogenous infection. (3) The coincidence of the conjunctivitis with other systemic gonorrhœal manifestations. (4) The bacteriological report.

Bacteriology.—When the patient was first seen, one slide after another was prepared and examined, until in one, three Gram-negative diplococci were seen, either within or upon three leucocytes. Eighteen slides had been carefully prepared and searched through before this result was obtained. Tubes of plain agar, blood-serum, hemoglobin, and hydrocele agar were then inoculated. After 20 hours in the incubator, they were examined. No growth was perceptible. Twenty-four hours later they were examined again. In the tube of hemoglobin agar a profuse growth was seen. The surface was thickly dotted with small raised colonies of whitish colour, which upon examination were seen to be the bacillus xerosis. In the midst of this growth, two colonies of different appearance were seen. They were larger, moist looking, and colourless. Upon examination, these were found to be Gram-negative diplococci. These two moist colonies with the surrounding growth necessary, were then transferred to other tubes of hemoglobin agar. From day to day the

growth of the Gram-negative diplococcus increased, so that, at the end of seven days, we had a profuse mixed growth of the Gram-negative diplococcus and the bacillus xerosis. They were then easily obtained in pure culture. Blood cultures were taken upon two occasions. The first was negative. The second, taken at a time when the systemic infection was marked by severe pain and high temperature, gave us, after 48 hours, tiny points over the hemoglobin agar. These were found, upon examination, to be Gram-negative diplococci, which, however, we were unable to transfer.

The Gram-negative diplococcus obtained from the conjunctival secretion was compared with a micrococcus catarrhalis, obtained from the nose, a meningococcus from the cerebrospinal fluid, and a gonococcus from the urethra. It grew only at the body temperature, did not grow on plain agar, gelatine, blood serum, bouillon or milk. Grew well on hemoglobin agar, with typical appearance. It fermented dextrose. So that in morphology, cultural features, sugar reaction, this diplococcus was differentiated from the meningococcus, the micrococcus catarrhalis, and saprophytic Gram-negative diplococci.

The micrococcus catarrhalis and other Gram-negative diplococci are frequently found on the normal and inflamed conjunctiva. This makes differentiation necessary. The Gram-negative diplococci found on the conjunctiva in purulent ophthalmia are not always gonococci, or those on the conjunctiva, in meningitis cases, not always meningococci. Every case of catarrhal conjunctivitis occurring in a patient with systemic gonorrhœa is not metastatic. Careful bacteriological examination is necessary and where Gram-negative diplococci are found, careful differentiation.

Pathology.—A snipping from the palpebral conjunctiva was taken, fixed in Zenker and cut in paraffin. Examination of the tissue showed the following: — The epithelium is studded with polymorphonuclear leucocytes. The subepithelial tissue shows œdema of the vessels, some perivascular infiltration, with lymphoid and plasma cells. The lymphatics are dilated. Immediately beneath the epithelium the vessels are engorged, and contain numbers of polymorphonuclear leucocytes, which can be traced in an unbroken path to the epithelium. The presence of this large number of polynuclears in the blood vessels may be of some significance, as it is believed the gonococci in metastasis are carried as emboli to the seat of the inflammation.

A search through a series of sections specially stained for microorganisms gave negative results. Kurka examined tissue from a case and was also unable to find pathogenic organisms. During the last three

years I have examined a great many conjunctival sections for organisms. Snippings from cases due to the Morax-Axenfeld diplo-bacillus, the pneumococcus, bacillus influenzæ, and other organisms were taken, where, in the secretion, these were found in large numbers. Often a search for them in the tissue proved negative. Under such circumstances, it is not surprising that search for the gonococcus in the tissue in metastatic conjunctivitis has upon these two occasions given negative results.

But it may be asked, why, with gonococci in the conjunctival sac, was there such a mild clinical course? Stock has shown organisms causing a metastatic inflammation produce a much milder form than when introduced in some other way. Again, if gonococci were present in smear and culture, why call the conjunctivitis metastatic? The clinical history and course answers this. The endogenous type of gonorrhœal ophthalmia varies considerably in severity. The virulence of the urethral infection may have been attenuated before the eye became inoculated. Mild cases undoubtedly occur, but it is to be remembered that some of these mild infections are not due to the gonococcus, but to the micrococcus catarrhalis and other causes.

The interesting points in this case, which gives us a classical picture of a metastatic conjunctivitis in gonorrhœa, are as follows:—The retropulsion of the old writers was very definite, although urethral discharge had been present from three to four months, with the onset of the eye symptoms, the discharge stopped. Subjective symptoms were present from three to four days. The onset of the conjunctivitis was indefinite, and simultaneously in both eyes, following sexual excess. The previous history of the patient was good, no rheumatism. The clinical picture and the course of the conjunctivitis, almost without treatment, were mild, as compared with the exogenous type. The tendency of the conjunctivitis was to recur, and to remain a conjunctivitis, as it does in 65% of the cases. The rheumatism occurred shortly after the conjunctivitis, and ran a typical course. Our interest, however, in the present case centres around the bacteriological report. As has been stated, some writers give the absence of the gonococcus in the secretion as an important point in the differential diagnosis, and attribute the metastatic inflammation to a toxin. More likely the gonococci were present, but through faulty methods were not found. The organisms must necessarily be few in number, and a bacteriological report from the examination of one or two slides shows one how easily error may creep in. In this case eighteen slides were examined before any definite result was obtained.

That I was able to cultivate the gonococcus I attribute to having seen the case in its early stage, and to having used media upon which the gonococcus would grow as profusely as would the contaminator. That I obtained it in pure culture was due to frequent transplanting for days, when I really felt the task hopeless.

Axenfeld says: — "Axenfeld-Morax in his exact bacteriological research stated that scattered gonococci may be found in such cases, Parinaud made the same observation, and their results were confirmed by Van Moll. We must not, therefore, conclude from a negative examination for gonococci, that the inflammation is due to a pure toxin metastasis, and not metastasis of the organisms themselves, though the former cannot definitely be excluded. Certain proof, however, is not yet available."

I believe that the present case makes proof available, that metastatic conjunctivitis is not due to a mixed infection, is not caused alone by the gonotoxin, but that it is a true metastasis of the gonococcus.

NOTES ON THE PATHOLOGICAL ANATOMY OF CONGENITAL HIP DISLOCATION.*

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The idea of presenting some notes on the pathological anatomy of congenital hip dislocation is to bring to your attention certain facts which greatly influence the treatment and prognosis in certain cases and in order that the reduction of the condition may not be viewed from the point of traumatic luxation alone.

Before the so-called "bloodless reduction" came into vogue in select cases, in many of the great clinics the "open reduction" was practised following the Hoffa-Lorenz operation.

Historical Note.

The condition of congenital dislocation was recognized from very early times. Hippocrates mentions it. Ambrose Paré, in 1678 described the symptomatology. Verduc, of Paris, in 1701 reduced congenital dislocation by traction, but found that recurrence always was a sequel shortly after traction was abandoned. Thus the attempts continued with slight improvement of results by the open reduction method, until 1895, when Lorenz presented his method of reduction and retention. Many other surgeons practised in the early times the traction method—Dupuytren,

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Malgaigne, Pravaz, Paci, and many others. The proper fixation of the head of the femur after reduction in the acetabulum and a rational method of reductions were the crucial points.

After the first work of Lorenz the extreme abduction or rectangular position was adopted. This, with certain modifications, is now generally practised. However, many relapses were reported and the percentage of anatomically perfect results was relatively small, anterior reposition and relapses being frequent. This leads me to examine and review many of the causes of these failures.

Classification of Types.

From observation of cases and not taking into account the secondary differences in very adult cases, Lorenz and Reiner give three main varieties of this condition.

1. This case, *in utero,* marked flexion of the legs being present, the head of the femur is below and behind the cavity of the acetabulum. At delivery and with extension of the legs the head of the femur becomes superior and posterior immediately, thus a superior and posterior position, secondary to an inferior and posterior.

2. *In utero,* the head of the femur lies below and slightly behind the acetabulum, but on delivery comes to rest, owing to laxness of capsule or probably some deficiency in the bony skeleton, not in the axis of the acetabulum, but against the superior lip of the same (*vide* Fig. 1, healthy side).

3. Primary, supracotyloid dislocation. The head of the femur is felt in position according to the anatomical condition of the neck of the femur, deformed or normal. Thus either a subspinous in anteverted femoral neck (as in Case IV), or directly above the acetabulum as in Case II.

Clinically, a good working classification is as follows:

I. Anterior or subspinous,

II. Supracotyloid,

III. Posterior or iliac,

IV. A form presenting a combination of I and II, or I and III, according to the position of the femur in flexion or extension.

Anatomically, we find that there are three separate bones combining to form the os innominatum. These three all converge in the Y cartilage of the acetabulum. Here some primary differences are found in cases of congenital dislocation. Heusmer and Saintons have described cases of newly-born, and the former a six months fetus. In these were found a slight deficiency of the upper rim and marked diminution in the size of the acetabulum as compared with the other side. Other observers have

confirmed the fact, and that on the pathological side the cavity is made still more shallow by fibrous tissue and fat deposit. I myself well remember a case I saw in a Paris clinic of a new-born child in which there was a marked posterior or iliac dislocation. In this case there was a deficiency in the rim in its posterior and upper segment.

The condition of the acetabulum has been frequently confirmed, in fact Hoffa reports that in every case which he treated by the open method he found a definite cavity, always big enough to receive the tip of his index finger. Here, then, we have a primary very important point, a shallow acetabulum and in some cases, before and at birth, a slight deficiency of the rim of the acetabulum in its upper and posterior parts. This may be very slight, as seen in the sound side of Case I. Besides this the shallowness of the cavity is not regular, but rather triangular in shape, base downward, the upper half being more affected than the lower. Also a ridge gradually forms running vertically from the tip of the ilium downward to the posterior border of the acetabulum. A specimen in Joachimsthal's clinic shows this very well.

In the progressive cases this factor must be remembered. Some very good specimens, which may be studied in the Dupuytren Musée, Paris, and in the Berlin and Vienna collections quite confirm this.

Naturally, further changes are produced in older patients, especially when body weight becomes a factor. Where the head rests a new depression is found (Cases III, IV, V and VI). Where the head of the femur finds no fixed place to play in, there may be a slipping around of the head and still another depression formed. The Dupuytren Museum has a specimen where three such new cavities are present, one above the other. Nelaton also describes a specimen in which the head of the femur worked freely according to posture in two such cavities, but a persistent new joint is not common as the opportunity for the same is not favourable (Ludloff). The anterior or the subspinous position is the form presenting the most favourable chances as is seen in specimens 4 and 5. This is due to the fact that the femoral head is firmly held and prevented from upriding by its subspinous position and the Y ligament of Bigelow.

In the head of the femur there are many different forms presented. Of clinical and practical interest the most important, apart from the closely allied to normal form, is the so-called "anteverted head." This Lange claims to be due to a torsion of the femur; others, however, say that it is due to a bending forward of the head, the torsion being a very slight factor. Clinically, to recognize this form is very important, as, if treated in the ordinary method of first and second flexion, an anterior reposition is sure to result (Case III).

Another form of the femoral head is the "mushroom form," not very uncommon. More uncommon is the "knob-shaped head" (as in Fig. 4), or the "upturned one" (as in Case II):

The important factor as regards fixation is to remember the axis of the neck and head of the femur, and retain the same in that point of your acetabulum. In the pelvis, in general, unilateral luxation causes a deformed cavity as seen in specimen. This is the most important change. The capsule becomes thickened and varies in form. In the anterior position the Bigelow Y ligament plays a very important rôle; the head is held and prevented from slipping further upward by this important band.

In the secondary posterior variety the capsule assumes an hour-glass form, and becomes twisted on itself, due to the new position of the head. The muscle changes are due to the altered relationship between the origin and insertions; thus we have in general the distance between the ilium and trochanter shortened. On the other hand, the distance between the os pubis and femur is lengthened. The diagram explains this far more clearly.

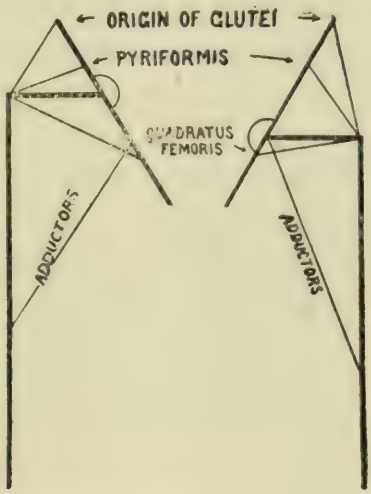


Chart showing altered muscle relations due to upward displacement of femur.

Here mention must be made of the Trendelenburg symptom. As is known, this consists as follows: The patient, standing with his back to the observer, flexes his thigh first on one side, then on the other. If there is any factor causing loss of tone in the pelvitrochanteric muscles of one side, whether due to alteration in length or to some lesion, and which at the same time permits weight-bearing, the side of the pelvis opposite to the lesion drops when the thigh of the same side is flexed. Whereas, on testing the other side, in contradistinction, it rises. This is readily ex-

plained by the diagram of the principle of the lever. The symptom is of distinct value in cases of congenital luxation, coxa vara, and coxitis.

Functionally, a very important rôle is played by the iliopsoas muscle. In the posterior variety this muscle and its tendon practically act as a sling to the pelvis and prevent further upriding of the head on the dorsum of the ilium (Lange). Naturally, on the affected side there is marked diminution in the tone and power of the muscles. This is very well demonstrated clinically by the Trendelenburg test. In the Class I of Lorenz's classification, where on erect posture there is an anterior position, but when much weight is thrown on the limb or flexion is present it assumes the dorsal or iliac position; here we usually find the neck is twisted and the head is in the anteverted position with the epiphysis eccentric from the line of the normal shaft neck angle.

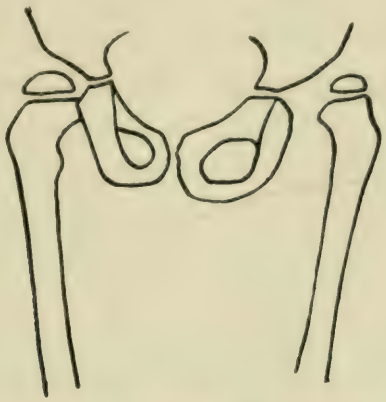
What is to be done? Naturally, the reduction is the first treatment, and the original first position, as laid down by Lorenz, practised. This allows for contracture also of the posterior and inferior capsule and periarticular support (muscles, etc.). Slightly also is the superior capsule shortened. The head now, though replaced, also assumes a partial anterior reposition owing to the deformity present. If the operator feels that he can replace the head and fix it in that position, at the same time bringing the femur down to a position of 45 degrees abduction, well and good. Should, however, this not be obtainable, it is wise to fix the same for a month or six weeks in extreme axillary abduction, as advised by Werndorff. This assures the position of the head in the acetabulum, and also assists in the contracture of the superior and anterior periarticular support. The choice must be made between this position and the position of internal rotation with 45 degrees abduction. Then the next fixation must be carried out with the femur sufficiently internally rotated to replace the head, and at the same time in 45 degrees abduction of the shaft, in order to assure the concentric position of the femoral head in the acetabulum.

The question of weight-bearing depends entirely on whether the operator feels confident enough of his fixation to allow it. Personally, I do not agree to it, except in very selected cases. Naturally, in all fixations, the same must not be carried out for too long—to allow contractures to fix the limb in a pathological condition.

From my own practice and from the clinic at the Royal Victoria Hospital, I have selected examples of these varying conditions.

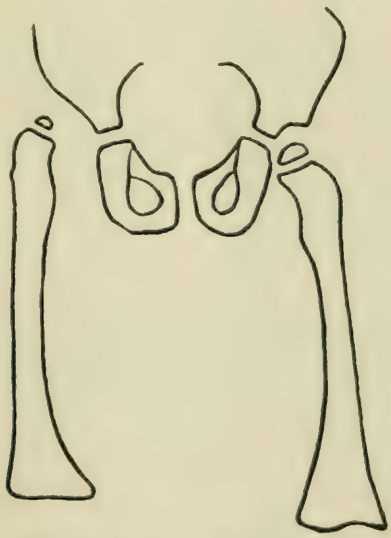
Case I.—This presents a combination of two types mentioned. In the first place, on the apparently sound side, we see a distinct defect in the contour of the upper rim of the acetabulum. This is seen in most cases of

so-called subluxation. Besides this, the epiphysis is set on the neck in an eccentric position; thus, on weight-bearing the head does not lie in the axis of the cavity, but on the upper and outer lip which, combined with the deficiency above noted and the laxness of the ligament—as shown by the position of the head—readily explains some of those cases which



CASE I.—Note dislocation on left side—complete—anteverted upturned head. Subluxation on right side.

gradually develop as the weight-bearing in walking increases. These cases are not uncommon, and for a time observers, especially in Paris, held that this was always the primary condition—that it was not congenital, but progressive. This is certainly not so, however, in all cases, as is proved in Case II.

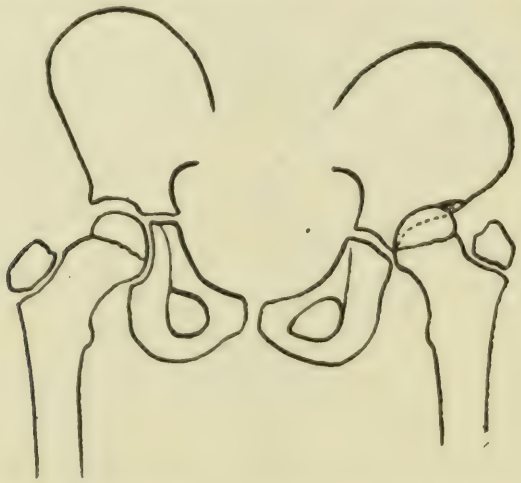


CASE II.—Note rudimentary acetabulum—supracotyloid dislocation—superior rim of cavity so deficient that auxiliary fixation was indicated—almost no shaft neck angle.

Case II.—This case is of interest as the luxation was present before any weight-bearing to my certain knowledge. The influence of heredity presents a predisposition in this case, the mother had a so-called double-

jointed condition of shoulder and hip, besides very marked hyperextension of fingers and hands. Here we find almost rudimentary acetabulum; there is a very deficient upper lip, and the head of the femur is best seen in the diagram directly above the cavity of the joint. There is a marked deficiency of development in the head of the bone. Almost a total absence of shaft and neck angle may be observed; besides the epiphysis is perched almost on top of the bone. This plainly demonstrates the impossibility of the second fixation being made in the same position as in Case I. This head must be held in the acetabulum until the upper lip develops and the ligamentous structures around the joint have contracted sufficiently to hold the same in place. Naturally, as I observed before, the fixation must not be continued until contractures fix the limb in a pathological condition.

In this case also the radiogram might be misleading, as by it there appears to be a very shallow cavity of the acetabulum, but we must remember that the limb remains completely cartilaginous until the third or fourth year (Ludloff). In this very case on reducing there was found to be a sufficient cartilaginous posterior lip to retain the head in the cavity until



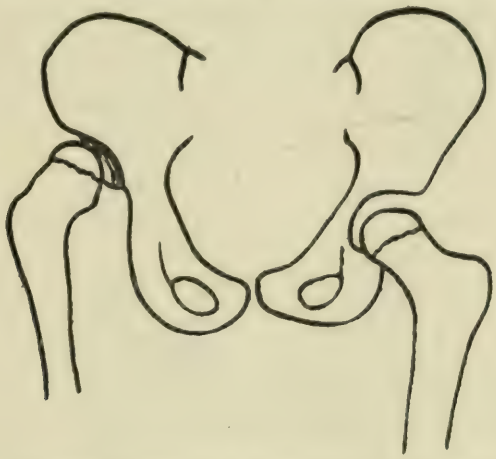
Case III.—Example of fixation with non-attention to condition of anteverted head present—note new subspinous acetabulum.

a position of about 45 degrees abduction was reached. It then slipped out. How different does this appear from the radiograph probability?

Case III presents an example of non-attention to the anatomical condition of the head when anteversion is present. In this case you can again see the slight eccentric position of the epiphysis on the well side. On the pathological side can be seen the tracing of the new acetabulum subspinous in position. Clinically the head is readily felt there; functionally, the case shows about one inch shortening, some eversion of the foot, and from the present bony purchase there will be no augmentation

or deformity from weight-bearing. But it is a clear example of not paying attention to the anatomical condition at the time of second and third fixation. The head was a distinctly anteverted one reduced in 1903 by Lorenz. The parents then neglected further advice—keeping the cast on for one year, and then allowing child to walk as she could.

Case IV.—Patient aged twelve; walks with eversion and one inch shortening. This case presents a well-marked acetabulum which has



Case IV.—Note well-marked subspinous acetabulum and constant joint relation.

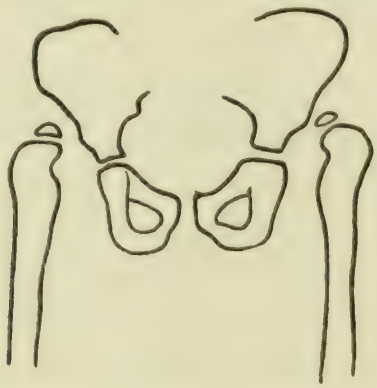
been produced subspinous. This case illustrates very well the contention of Ludloff that this variety alone presents conditions favourable to a stationary joint in a new position. The head of the bone is well held

Case V.—Antithesis of No. 4 Rudimentary Acetabulum. Note flattening of pelvis due to constant weight bearing.

against the ilium by the Y ligament of Bigelow. Clinically, there was absolutely no upriding and a firm new joint was established.

Case V.—Patient, aged twenty-six. This case presents an antithesis to the previous, a very movable condition of the head of the femur. There

is still present a rudimentary acetabulum, but weight-bearing shoves the head well up toward the crest of the ilium posteriorly. The patient, as in all these cases, at times relieves some of the weight by pressing his hand firmly over the right buttock. From the extent of the upriding it would seem probable that the iliopsoas bears up a suspending action. With regard to the pelvis it is interesting to note that on the healthy side there is gradually developed a flattening due to constant weight-bearing on that side. This naturally in the case of the female patient would be of very great importance as tending to cause rotation of the fetal head during parturition. Otherwise the pelvis presents the usual somewhat slightly arrested development on the affected side.



Case VI.—Typical bilateral dislocation supracotyloid.

Case VI.—This case presents a typical bilateral dislocation. Here there is a slight difference on the two sides, the acetabulum being much better formed on the left than on the right side. The condition was one of typical supracotyloid dislocation, readily reduced, but at the same time showing the rim of the acetabulum to be sufficiently developed that the head might be retained in position until 60 degrees abduction was obtained, it then slipped out. On the right side, however, this rim was very poorly developed, the head dislocating backward when about 40 degrees abduction was obtained. On being reduced, the head of the femur slipped into the acetabulum instead of slipping over a definitely formed rim. Clinically, the patient presented the usual classical symptoms.

Case VII.—This case was a unilateral, left-sided, congenital dislocation, aged eighteen months. The child had not walked. In this case the contour of the trochanters is quite bluntly shown. The shaft neck angle is preserved; however, on the side of the dislocation, the radiogram presents almost no acetabulum. Clinically, this was not entirely confirmed. However, the acetabulum was very deficient superiorly, the head was separated by a rim on testing, but it slipped progressively backward when abduction was practised as though there was practically no obstruction be-

tween the acetabulum and posterior dislocation. This was proved clinically by the readiness with which the posterior dislocation was brought about. In a case such as this extreme rectangular abduction would be indicated as the first position.

CASE VII.—Note rudimentary acetabulum—Reluxation very readily obtained.

CONCLUSIONS.

1. The condition is usually intrauterine in occurrence, relatively seldom resulting from difficult delivery.

2. Some few cases may develop progressively, where there is some deficiency of the upper lip of the acetabulum, combined with relaxed ligaments and loss of tone in the surrounding muscles.

3. Before attempting reduction, the shape and axis of the head of the femur should be ascertained, also condition of acetabulum.

4. In young cases the radiogram may be misleading owing to the predominance of cartilage in the formation of the articulation.

5. Reduction may be carried out either over the posterior rim of the acetabulum or the inferior, according to the experience of the operator.

6. After reduction the "range of retention" in the joint should be ascertained by redislocating and fixation adopted in the position most removed from the recurring point.

7. Malposition, especially that resulting from anteverted head, should be carefully guarded against.

8. Between fixations it is wise to control the position of the head by means of the radiogram.

9. In older cases, after six years of age, the possibility of contractures in a faulty position must be guarded against. Therefore the fixation must not be of too long duration—6 weeks to 2 months.

10. While weight-bearing may stimulate the development of the femoral head and acetabulum, it is not essential and quite contraindicated in a percentage of cases.

11. Owing to muscle changes the convalescent treatment of massage and exercises should be carefully followed until the disappearance of the Trendelenburg symptom.

12. Myorrhexis of the muscles is only occasionally essential.

THE

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THE MEDICAL CONVOCATION.

The Convocation of McGill University, which was held in the Royal Victoria College on June 9th, for the purpose of conferring degrees in medicine, was one of the most notable in recent years. The number of graduates was fully up to the usual average; the attendance of professors and members of the staff was unusually large, and the proceedings were characterized by interest and sobriety. The valedictory address on behalf of the Faculty, which was given by Dr. C. F. Martin, was fitly done since it struck at that spirit of pessimism which has been suspected in recent years amongst students, graduates, friends in the community, and even amongst the teachers. "McGill," he said, "was supposed to be descending the autumnal slope of decay while sister universities, with more students, perhaps, and more clamor, had been thought to be superseding her. Those who did not travel much, or who, while travelling, with a limited perspective, saw but superficially, failed to grasp the essential relations between a university and the district of which it is the educational centre. They failed to realize that in an ancient established country, full of traditions, populous and well seasoned, like Germany, the type of medical school was necessarily different from one which exists in a new and less populous land, where the duties and functions of medical men vary, of necessity, to meet the requirements of the country. If they glanced at the history of the faculty for the past fifteen years, they would realize that while even to-day their schools lacked much of the advanced kind of work seen in the European schools yet most remarkable progress had been made."

Dr. Martin then proceeded to recount some of the improvements made in the last few years in the university and its teaching facilities. The reconstruction of the General Hospital, the many additions to the Royal Victoria Hospital, the erection of a magnificent maternity hospital, with material for teaching and study equal to any in the world; the new infectious diseases hospital, the new university buildings, the adoption of a five years' course, and, finally, medical reciprocity with Great Britain, he thought, and we think, too, is final answer to those who affect to believe that the old was better than the new.

Dr. Martin was peculiarly happy in his selection of the model of attainment which he commended to the graduates as an exemplar. We cannot refrain from quoting his words: "The practitioners before you, my colleagues on this faculty, will, I know, unite with me in commending as your type the much-beloved physician of this city, whom illness has but recently incapacitated after so many years of self-denying devotion to the community. Courteous, gentle and forgiving, he possessed all the attributes of the perfect physician, because he combined with his great skill all the qualities of the perfect gentleman. An enemy of pretence and folly, he never allowed the fads and fancies of the irregular practice to sway him; but, with a remarkable faculty for holding to that which is good, he was never carried away by every medical novelty that arose, but saw that the tree was well shaken before he scrambled for the fruit. Sympathetic, generous, helpful to all, he carried out the all-inclusive though simple philosophy of his life to do the decent thing by his neighbour, and attend but to his own affairs. With such an aim, with such an ideal, with such a mission carried out, the world is better for his life and work."

The Dean in his sessional address was full of hope. He remarked that "in spite of the fire of 1907 and the establishment of a five year course, there were sixty new students enrolled in 1907, and eighty-five last session. Though the faculty had been depressed somewhat owing to the fire, things were pointing to an awakened activity. They looked forward to taking possession of the new medical building next year, when they would convince sceptics that McGill was able to hold her own among the finest continental institutions of the present day."

HEALTH CERTIFICATES BEFORE MARRIAGE.

It has lately been stated in the contemporary press that a United States legislature has made it a law that persons marrying in a certain district must present certificates of good health determined by medical inspection. There is something to be said in favor of the scheme and

much to be said against it, and we venture to predict that it will some day appear only as an addendum to some future description of the marriage customs of different races. Practically, the idea is not a workable one because the outcome will be either that certificates will be issued upon insufficient examination or that marriages will be performed elsewhere, to which may be added that the people who would submit to such a law would likely be the ones for whom it is least intended.

It is a fact that there are many people marrying every day who have no more right to marry than they have to be Prime Ministers or Presidents: some of these will see injustice in such a law, without seeing that providential laws with heavier penalties are being put in force against them every day—that their marrying entails penalties of short life, offspring of ill-physique, of low mentality, of absolute unfitness for the struggles of every-day life: if they could come back and see the misery that their selfish thoughtlessness has imposed upon their progeny they would trebly curse their ignorance and their folly. Yet, although this is perfectly true, it is not often that the physician's advice is taken upon such a subject or the physician's veto allowed to interfere. Thus the law which tries to protect a fool against his folly will prove its inadequacy, because there is inherent in fools the quality of folly.

DIAGNOSIS BY RULE OF THUMB.

The story is told of a well-known clinical teacher that coming into his lecture room he was greeted from the back benches by "Professor, give us some good pointers to-day." He paused a moment and then shaking his fist in the direction from which the voice came said, "Pointers, you fool; it is principles you need and not pointers." While we all cheerfully grant the importance of principles yet most of us have a sneaking fondness for pointers. Have we forgotten the euphemistic rhymes and catch phrases by which we fixed various anatomical facts in our early medical intelligences? Truth to tell, some of us remember the rhymes but would be hard put to if we had to give the anatomical points they represented.

However, this habit tends to cling in later years and is partially represented by the man who makes his diagnosis by rule of thumb. To him, only the typical picture carries any enlightenment; a patient who has all the signs of typhoid fever except rose spots cannot have the disease, in his opinion, because this one feature is lacking. It is a good day for a man when the realization of the variability of disease comes home to him, and happy are those who know it early. To them, the shifting pictures

only add interest to their daily study of disease. This attitude of mind is especially shown in the diagnosis of conditions—such as those in the lung or pleura—in which the correct interpretation of physical signs is important. To those who work by rule the typical case may not offer special difficulty, but the atypical ones find them entirely lacking in equipment for their solution. They are on an uncharted sea and have no means of finding their bearings. They do not work by principles but by rule of thumb.

Take the findings described by Dr. Thomas McCrae as brought out by the study of a series of cases of empyema and delayed resolution in lobar pneumonia, in this number. In many cases the physical signs seemed against the rule—for example the character of the vocal fremitus—and if one went only by the rule a correct conclusion would be certainly difficult and often impossible. Yet, at first glance, the diagnosis of these two conditions should not appear to offer any great difficulty. It all agrees with the statement of Locke that "We can have knowledge no farther than we have ideas." If our ideas in medicine go no farther than working by rule our knowledge must fall far short.

POLLUTION OF WATER.

At the meeting of the Royal Society held in Ottawa on May 25th, 26th and 27th, it was moved in section 3 and a resolution passed and reported from the section to the general meeting of the Society, that the Society memorialize the Federal Government to investigate how the Government could prevent and pass any legislation necessary to prevent any city, town, village, hamlet or any municipality, company, factory or private resident on the banks of any of the water ways of the Dominion from running their sewage into any water way, without that sewage being first treated by some process of purification, and to prevent any effluent water from such a sewage treating plant *entering* any water way, unless it be of a standard of purity to be established by law, and that the Government appoint some authority which will efficiently carry out the necessary legal enactment: also to prevent all companies or individuals, or any other persons whatsoever, from dumping any untreated sewage into the rivers or water ways they are navigating.

This motion was proposed by Dr. Girdwood and seconded by Sir Sandford Fleming at the last meeting, and the Council was instructed to take it up and act upon it.

At the meeting of the Medico-Chirurgical Society of Montreal held on Friday, June 4th, Dr. Girdwood proposed and Dr. Adami seconded the passage of a similar motion for the purpose of supporting the action that the Royal Society might take in the matter.

Reviews and Notices of Books.

Principles and Practice of Physical Diagnosis. By John C. DaCosta, M.D. W. B. Saunders.

This work deals only with the thorax and abdomen. As its title implies it is chiefly concerned with physical signs, laboratory technique being omitted with the exception of a few paragraphs bearing on the diagnosis of special lesions.

A great deal of accurate information is compressed within the 500 pages of the book, but much of it is so condensed as to prove difficult reading to the student and uninteresting to the practitioner. This applies particularly to the paragraphs on clinical pathology. The text is extensively illustrated and well printed.

Constipation and Intestinal Obstruction. By Samuel Goodwin Grant, M.D., LL.D., Professor of Diseases of the Rectum and Anus in the New York Post-Graduate Medical School and Hospital; Attending Surgeon for Rectal Diseases at the New York Graduate and St. Mary's Hospitals and the German Polyclinic Dispensary. Published by the W. B. Saunders Company, Philadelphia and London, 1909.

This book is of convenient size, well printed in clear type on smooth paper and abundantly supplied with well chosen illustrations. The volume is divided into 44 chapters which, with a good index, makes reference easy and thereby enhances its value to the busy practitioner. The subjects treated of have been dealt with in a clear, methodical and rational manner. Constipation is properly considered as only a symptom and not a disease *per se*. In one case it may simply indicate some functional disturbance, while in another it may depend upon a great variety of pathological conditions.

The author has clearly pointed out that every case of constipation to be treated successfully must be studied from an etiological standpoint, and he is most emphatic in declaring that there is no routine method of treatment. The drugging of constipated patients is deprecated and held to be pernicious, and very rarely indeed is anything accomplished towards giving permanent relief. In spite of this fact the confession is made that purgatives are frequently resorted to by the author at the request of the patient in order to secure a movement quickly. In the vast majority of cases chronic constipation can be cured without the aid of medicines by means of education, exercise, psychotherapy, dieting, hydrotherapy, massage, mechanical vibration, and electricity.

With a mild apology, and for the benefit and convenience of the general practitioner, who is not familiar with the more rational and safer methods of treatment, two chapters have been devoted to medicinal treatment and the setting forth of a large number of special formulæ calling for purgative pills and mixtures. Much importance is placed upon psychic influences as a potent factor in overcoming the constipated habit: "The large number of undoubted cures from chronic constipation which have been made by Christian Science healers goes far to substantiate the powerful influence of the mind in controlling the bowel movements."

Chapters 2 and 3 deal with the anatomy and physiology of the gastro-intestinal tract. They are specially interesting chapters and are admirably illustrated. Chapter 4 deals with classification and general remarks on etiology, where drugs are again held to be one of the most common causes of constipation in this country. The mechanical causes of obstruction are considered at considerable length, and the varying symptoms and differential diagnosis, depending upon the point of obstruction, whether in the small bowel or in the large, are fully discussed. The last two hundred pages of the book are devoted to operative surgery, where the various operations are discussed and the author's preference given for some particular procedure to meet the various pathological conditions met with in cases of intestinal obstruction. The volume taken as a whole makes interesting reading and the reader finds much to praise and little to condemn. The one thing to be regretted is this, namely, that it was thought necessary, or advisable, to duplicate so much matter which has already appeared, in perhaps slightly different words, in so many other text-books and monographs.

F. R. E.

American Practice of Surgery. A complete system of the science and art of surgery, by representative surgeons of the United States and Canada. Editors: Joseph D. Bryant, M.D., LL.D., and Albert H. Buck, M.D., of New York City. Complete in eight volumes. Profusely Illustrated. Vol. V. New York: William Wood and Company, 1908.

The present volume is very largely devoted to surgical affections of the head and of the cranial nerves; diseases, abnormalities and wounds of the face; hare lip and cleft palate; and the surgical diseases of the eye, ear, pharynx, larynx and trachea.

378 of the 392 pages are devoted to surgical affections of the head. The article is written by Dr. Edward Archibald. It is very full and

comprehensive. Dr. Archibald gives his readers the benefit of the experience of the great masters, Kocher and Sir Victor Horsley, quotes largely from the work of Harvey Cushing and has taken up each subject with great care. The article is remarkably well illustrated, many of the illustrations being taken from the museum of McGill College and from the Montreal General and Royal Victoria Hospitals. It is altogether a very creditable piece of work and reflects great credit on the author. The article perhaps is legitimately subject to the criticism of being verbose, and, in some parts, a little tiresome. 378 pages is rather a long article on the surgical affections of the head, particularly when it does not include the surgery of the cranial nerves, the surgery, diseases, abnormalities and wounds of the face, hare lip and cleft palate, sinus thrombosis of otitic origin, nor the pyogenic diseases of the brain of otitic origin. Yet the reader will find in it a wealth of information and a valuable article for reference.

Chas. H. Frazier writes the article on the surgery of the cranial nerves, and few men can speak on this subject with greater authority. His article is compact, well illustrated, and in it are very clearly and ably set forth most modern views on this important subject.

Surgical diseases, certain abnormalities and wounds of the face, are dealt with by Chas. de Nancrede, of Ann Arbor; it is well written and clearly illustrated.

Hare lip and cleft palate are treated by James Stone, of Boston, in an article which is fully up to date.

Harlan writes the article on diseases and wounds of the eye and ear; John Richards on sinus thrombosis of otitic origin, and suppurative disease of the labyrinth; Reik, pyogenic diseases of the brain, of otitic origin; Chas. Knight, surgical diseases and wounds of the pharynx; James Newcomb, surgical diseases and wounds of the larynx and trachea, and Frank Hartley the article on laryngectomy.

Mechanically, the work is well done, and in the best style of William Wood and Company, publishers.

TREATMENT OF CONSUMPTION. By W. CAMAC WILKINSON, M.D., University of Sydney. Macmillan and Co., London, etc. The Macmillan Company of Canada, Toronto. Price, $3.00 net.

The text of which this book is an exposition is contained in the introduction in the following words: "Through the profound genius of Koch, and Koch alone, a certain, safe, and trustworthy remedy has been found for the treatment of pulmonary tuberculosis." We take the liberty of contradicting Dr. Wilkinson, and also of affirming that

there is no "certain" remedy for pulmonary tuberculosis. Some patients get well with no treatment: some die in spite of all treatment. There is no disease in which the issue and event of the thing is more uncertain, and when Dr. Wilkinson says to the "profession in every part of the globe," "Go and do thou likewise," we plead that we do not know where to go or what to do. As an act of piety towards commemorating the semi-jubilee of Professor Koch's discovery of March 24th, 1908, the publication of this book is praiseworthy; as an affirmation that a "certain" remedy has been discovered for pulmonary tuberculosis it cannot be allowed to pass. And yet the author sets forth his records upon 80 pages, adorned with such expressions as "almost a miracle," "improved beyond recognition," "picture of health." If the comments which the author makes upon his fellow physicians are justified, the condition of the profession on the other side of the world would appear to be a deplorable one. He cites the cases of Galileo and Harvey on his behalf; yet it is worth remarking that a "discovery" is not necessarily authentic because it is scoffed at. No one who is interested in the prevention or cure of tuberculosis can afford to be ignorant of this book.

PROGRESSIVE MEDICINE. Edited by HOBART AMORY HARE, M.D., and H. R. M. LANDIS, M.D. Lea and Febiger. Philadelphia and New York. Vol. II. June 1st, 1909. Six dollars per annum.

The contributors to this volume are John G. Clark, William B. Coley, Edward Milton Foote, Edward Jackson, and Alfred Stengel. The subjects are, hernia; surgery of the abdomen; gynæcology; diseases of the blood; and ophthalmology. An index completes the volume. The illustrations are remarkable. The art of drawing is revived in all its truthfulness, and we may well hope that the photograph, with its obscurity and falseness, is passing away. The illustrations for Dr. Coley's article on hernia recall the great days of Bell, and the draughtsmen for "Gray's Anatomy." The surgery of the abdomen by Dr. Foote is equally enriched with figures which do really illustrate. The article upon gynæcology is written by Dr. Clark, of Philadelphia, and is in marked contrast with those premature assertions, ingenious though preposterous theories, and extravagant claims which are habitual in writings upon this branch of surgery. Dr. Stengel's consideration of diseases of the blood is marked by that good sense and good style to which we have grown accustomed in his previous work. An admirable summary is made of Dr. Pavy's lectures before the Royal College of Physicians upon the pathology of diabetes, though Dr. Stengel omits to mention that these lectures were published in this Journal concurrently with that in the *Lancet*. Full refer-

ence is made to the "startling view," which Dr. Eccles put forward, of the ætiology of diabetes in the *Medical Record*, May 9th, 1908, under the title "Darwinism and Diabetes." According to this view the excessive production of sugar is a protective agency against a bacterial blood infection, rather than an aimless or destructive one. We commend this volume with respective praise.

Retrospect of Current Literature.

PATHOLOGY.

UNDER THE CHARGE OF DRS. ADAMI, KLOTZ, AND NICHOLLS.

RETROSPECT IN PATHOLOGY FOR 1908.*

Adami.—Principles of Pathology, Vol. I., 1908. Lea and Febiger.
Abbott.—Statistics of Congenital Cardiac Disease. Jour. of Med. Research, July, 1908, p. 77.
——— Also, Vol. IV., Osler's Modern Medicine.
Aschoff.—Arteriosclerosis and other vascular scleroses. Beihefte zur med. Klin., Wien., 1908, 4 Hft. 1.
Klotz.—Experimental "Work" Arteriosclerosis. Montreal Med. Journ., March, 1908.
MacCallum and Voegtlin.—On the Relation of the Parathyroid to Calcium Metabolism and the Nature of Tetany. Johns Hopk. Hosp. Bull. March, 1908.
Silvestri.—Calcium Salts in the Treatment of Convulsions. Gazz. degli Osped., October 4th, 1908.
Eppinger, Falta, and Reudiger.—Zeitschrift f. klin. Med., 1908, LXVI.
Pemberton and Sweet.—Archiv. Int. Med., 1908, I., 628.
Fleischmann.—Berl. klin. Woch., March 9, 1908.
Lesser.—Med. Klin., March 1st, 1908.
Wright.—Vaccine Therapy and Therapeutic Immunization. Practitioner, 1908, VI., 565.
Opie.—The effect of Injected Leucocytes upon the Development of a tuberculous Lesion. Johns Hopk. Hosp. Bull., April, 1908.
Jochmann.—The Connection between the Proteolytic Ferments of the Leucocytes and general Immunity. Zeitschr. f. Hyg. und Infektionskr., LXI., 71.
Henry and Rosenberger.—Typhoidal Meningitis. Proc. Path. Soc., Phila., February, 1908, No. 2.
Lavenson.—Univ. Penn. Med. Bull., April, 1908.
Adami.—On a giant-celled Rhabdomyosarcoma from a Trout. Montreal Med Journ., March, 1908.
Klotz.—On the Large White or Soapy Kidney. Journ. Med. Research. New Series, Vol. XV., No. 1(Received for pub. Nov. 2, 1908).

The year 1908 will not take rank as one of startling achievement in the domain of Pathology. No great discoveries are to be chronicled, nor is there much that is new. Important questions, such as the causation of cancer and the production of immunity in tuberculosis, like the will-of-the-wisp, still elude our grasp. Yet, it would be quite wrong to conclude that nothing has been accomplished. Good, solid, earnest work

*Read at the last meeting of the McGill Medical Reporting Club, April 26th.

is still being carried on in all departments and an array of facts is being accumulated that can hardly fail to bear fruit in the long run. It has been eminently a year of trial. Facts have been retried and reaffirmed, theories tested, and our knowledge of many difficult subjects has been placed on a solid basis. Times of this kind are inevitable and are perhaps more truly useful than are the more meteoric displays of knowledge and discovery.

In our survey of the work accomplished during the past year it is gratifying to note the excellent work that has been done right here in Montreal by investigators well known to ourselves, work that ranks with the best. It would be false modesty were we to pass it by without remark, and I shall take occasion in the succeeding pages to refer to more than one study of distinction emanating from our own laboratories.

Leaving aside for the moment the regulation "Arbeiten," the most noteworthy "event," to use a sporting phrase, was the publication of The Principles of Pathology, the first volume of which, by Prof. J. G. Adami, appeared last fall. This work is of importance, inasmuch as it indicates a distinct departure in the matter of pathological text-books. It would not become me, on account of my special interest in the work, to criticize it, but I think I may be allowed to draw attention to some of its more particular features. In the words of the author's preface it is an attempt "to place before student or physician in an orderly and reasoned manner the principles of Pathology, the science, as distinct from the practice of medicine: the science upon which that practice is or should be based." The work begins not with a study of the blood, as is customary with most German works on General Pathology, but with a study of the properties of living matter. Like Virchow, the writer commences with the cell, and in the changes undergone by it sees the basis of all pathological study. The book passes, therefore, naturally and logically, from the consideration of the histology, the physiology and chemistry of the cell, cell growth and multiplication, inheritance, to the causes of disease, the morbid and reactive processes, and finally, to the various tissue changes. Thus, it will be seen that the work is unique in that it deals with what may be called the "philosophy" of disease. The only other text-book, with which I am acquainted, that makes any attempt to consider the subject in a broad way, on fundamental principles, is that of Orth, a splendid work that ought to be by the side of every student of pathology. Orth, however, is a voluminous production, so far not translated into English, and in the matter of "principles" is somewhat desultory in treatment, lacking the logical continuity of Adami. Needless to say, the latest book will not appeal to the quiz-

compend man nor to the student desirous of getting at the necessary minimum of facts in the minimum of time and space, but to the thinkers and especially to those who already have a working knowledge of pathology the book comes as an inspiration. Eminently readable, like everything that comes from the pen of its writer, the work is as fascinating as an historical novel.

Another noteworthy production is that of Dr. Maude Abbott on Congenital Cardiac Disease. Her paper on this subject in the July number of the Journal of Medical Research is, I take it, but a sketchy presentation of her contribution on the same subject in Vol. IV. of Osler's Modern Medicine. This is a monument of careful and thorough research, and inasmuch as, in large part, it is based upon a study of the excellent material in the Pathological Museum of McGill University, may be fairly claimed as coming into the category of Pathological Research. All the facts, up to the present, known in connection with a difficult and somewhat obscure subject are here presented to us in a clear, logical, and complete manner, and are dealt with from various aspects. This work will, no doubt, for many years remain "the last word" on congenital defects of the heart.

Arteriosclerosis.

The subject of arteriosclerosis has a special interest for us here in Montreal, inasmuch as not a little of the most important work has been done by one of ourselves (Klotz), work which has done more than all to put the pathogenesis of an unusually complicated condition on a sound footing. The most recent contribution on this subject is that of Ludwig Aschoff, whose visit to Montreal is still fresh in the minds of some of us, who gives a careful review of the work done on the subject and systematizes our present knowledge. The general result has been somewhat revolutionary. Ten years ago or less, Thoma's view, that the initial change in arteriosclerosis was a weakening of the media, was widely accepted and the theory usually taught in the schools. Now this is given up. The processes, variously described as arteriosclerosis, atheromatosis, endarteritis chronica nodosa seu deformans, and angiomalacia, are now held to be purely degenerative and not inflammatory, as Virchow thought, and to begin with fatty degeneration of the intima. The earlier stages of fatty softening (atheroma) lead to fibrosis and hardening (arteriosclerosis). Aschoff, therefore, strongly supports the proposal of Marchand to rename the whole process "Athero-sclerosis."

The normal thickening of the arteries occurring during bodily growth has been studied especially by Jores and his pupils. This physiological

process takes place mainly by an increase of the elastic tissue about the external elastic layer and to a less extent by increase of the elastic fibres of the intima. There is also a slight increase of the muscle fibres. All these changes result from the increasing tension to which the arterial wall is exposed. This structure remains as a rule unchanged until the age of 35 or 40, when variable senile sclerotic changes occur in the walls, consisting in the end of a further thickening of the intima by the growth of connective tissue. Microscopically, the first visible change is fatty degeneration of the oldest elastic fibres. In some cases there appears to be a new formation of elastic tissue along with the connective tissue, so that it is difficult to say where physiological thickening ends and pathological begins, at least in some cases. In the aorta, the elastic fibres become dissociated owing to solution of the cement substance. The fat thus resulting from the degeneration probably consists of cholesterin esters of fatty acids (Panzer), or cholesterin dissolved in fatty acids (Adami and Aschoff). Later, the cholesterin crystallizes out, and, according to Klotz, the fatty acids combine with calcium to form soaps, and eventually calcification takes place. The connective tissue may also show hyaline degeneration and swelling, resulting in a farther thickening of the intima. This tends to compensate the loss of elasticity that occurs after middle life. With regard to the smaller peripheral arteries, which have proportionately more muscular tissue in them than has the aorta, the senile changes may begin with fatty degeneration and calcification of the muscle fibres of the media. An increase of arterial tension at any age will tend to bring about sclerosis, owing to the loss of elasticity of the elastic and muscular wall.

A second type of arterial change is that met with in local inflammatory conditions, such as syphilis or other infectious diseases, which is of a different nature. The vasa vasorum are infiltrated with round cells, granulomata are found in the media with degeneration and destruction of the muscle fibres.

A third type of sclerosis is the functional physiological sclerosis found in the vessels of the ovary after menstruation and in those of the inner muscular layer of the uterus after pregnancy has taken place.

To throw some light on the causation of arteriosclerosis numerous experiments have been undertaken. These have been chiefly conducted by mechanically injuring the vessels or by injecting toxic agents into the circulation. Substances, such as adrenalin, barium chloride, digitalin, and nicotin, which have the power of raising blood-pressure, are all competent to bring about arterial lesions. Further, it has been shown that certain toxins, of bacterial nature, lead to changes in the vessel walls,

either by inducing degenerative lesions, or by stimulating the proliferation of certain cells. Some doubt has been expressed as to how far arterial lesions thus produced are to be attributed to the direct action of the toxic substances in question upon the tissue cells and how far to the increase of blood pressure. Klotz (Montreal Medical Journal, March, 1908) details some experiments with rabbits, which he carried on to determine this point. Taking young healthy rabbits and suspending them head downwards for three minutes daily for a period of about one hundred and thirty days, he was able to produce by physical means alone, hypertrophy of the heart and arteriosclerosis. The lesions were of two types, the one isolated in the media without intimal change and degenerative in nature leading to death of the muscular elements and calcification of the involved areas including the elastic fibres: the other, isolated to the intima, consisting mainly of a proliferation of tissue, which later undergoes a secondary fatty degeneration. His conclusions are that work plays a very important role in the production of arterial sclerosis of different characters, and that even in vessels of differing histological structure sclerotic changes can be brought about by increasing the work of the artery. Further, aneurysms may result as a consequence of degenerative changes in the media owing to increased work.

Appendicitis.

An elaborate monograph, by Aschoff also, "Inflammation of the Appendix, a pathologic-histological and pathogenetic Study," demands a few words. To prepare this work, hosts of appendices, normal and abnormal, fœtal and adult, have been examined by the method of serial section, and the whole study is an admirable example of German thoroughness and industry. Some of Aschoff's points are striking and even startling. One is, that four-fifths of all individuals who live out the ordinary term of years have passed through the ordeal of appendicitis unharmed. Therefore, he gives his judgment against all surgical interference. Later on, however, he saves the situation by admitting that, if Nature is not successful in dealing with the attack by her own methods after twenty-four hours, the surgeon should be called. Another point, somewhat at variance with our accepted ideas, is that not infrequently the mucosa over a fæcal concretion, though put upon the stretch, is comparatively unaltered. He does not think, therefore, that concretions are of much importance in initiating inflammation, though admitting their influence in determining perforation after infection has taken place. In the writer's opinion, the cause of appendicitis is enterogenous

infection starting at the bottom of the crypts. All that is necessary is the minutest loss of substance of the mucosa, thereby permitting the entrance of the offending micro-organisms.

Internal Secretion.

The subject of the internal secretions has for years past proved to be one of the most fruitful in pathological investigation. It lends itself particularly well to experimental research and is a field as promising as it is fascinating. While much has been accomplished, doubtless there is much more to be yet discovered. The spot-light of the research worker at present seems to be directed upon the parathyroids. These comparatively humble structures appear to have a most important part to play in connection with calcium metabolism.

Clinical studies on such conditions as rickets and osteomalacia have suggested the possible relationship of tetany to disturbances of the calcium metabolism. Loeb and J. B. MacCallum have shown that the injection of various salts will produce muscular twitching, effects which are removed by the exhibition of calcium salts. Parathyroidectomy in dogs is followed by muscular twitchings, spasm, exophthalmos, and rapid breathing. The striking observations of Verstraeten and Vanderlinden, Halstead, and others have shown that an abundant diet of milk, which is rich in calcium, suffices to minimize the symptoms of tetany or perhaps prevent it altogether. MacCallum (W. G.) and Voegtlin have shown that in the tetany of parathyroidectomized dogs the calcium content of the blood is only half that of the normal dog on the same constant diet. All the violent symptoms of parathyroidectomy can be instantly cured by the intravenous injection of a calcium salt. Subcutaneous injection or the introduction of the salt into the stomach produce the same beneficial effects but are slower. The injection of magnesium salts has a somewhat similar action, but the results are obscured by its toxic action. On the other hand, the injection of potassium salts intensifies all the symptoms. Calcium and potassium thus appear to be antagonistic. They conclude that in some way the parathyroids control the calcium metabolism, so that on their removal a rapid excretion, possibly associated with inadequate absorption and assimilation, deprives the tissues of calcium salts. There is an analogy with the condition described by Loeb and J. B. MacCallum, who showed that muscular twitching could be produced by the introduction of salts capable of precipitating the calcium in insoluble form, and removed by the addition of fresh soluble calcium. In the case of tetany, however, the central nervous system seems to be especially affected, since muscles isolated from nervous con-

trol showed no twitching during tetany. It is probable that these observations will prove of practical value not only in postoperative tetany, but in the spontaneous tetany of children and the forms arising in connection with infectious diseases, pregnancy and lactation. They suggest that in pregnancy the symptoms may be due to the great drain of calcium in the production of calcium-rich milk, especially in individuals in whom there is some parathyroid insufficiency.

I may remark in connection with these studies that several observers, Silvestri particularly, have treated the convulsions of infancy with calcium salts, apparently with benefit.

A paper of considerable importance in connection with the subject of the internal secretions is one by Eppinger, Falta, and Reudiger, based upon a long series of experiments. They show that the physiological relations of the thyroid gland, the adrenals, and the pancreas are closely connected. The simple direct effect of removal of the thyroid gland in starving dogs manifests itself in the body metabolism by a diminished nitrogen-output. The simple direct effect of hypersecretion of the adrenals, imitated by injections of adrenalin, is seen in the increased excretion of nitrogen and in the production of glycosuria. It was then found that extirpation of the thyroid had an indirect influence upon adrenalin glycosuria, for the latter symptom could not be produced in thyroidectomized dogs. By feeding the animals, however, with thyroid extract they could again be rendered the subjects of adrenalin glycosuria. Further, the injection of adrenalin in dogs deprived of the pancreas produced an excretion of sugar and a nitrogen elimination much in excess of that found in similar animals in whom adrenalin had not been injected. The removal of the thyroid secretion, on the other hand, had precisely the opposite effect on dogs in whom the pancreas had been removed. Preliminary removal of the thyroid decreased the elimination of nitrogen and sugar when the pancreas was lacking. If the two glands were removed simultaneously, the decrease in nitrogen and sugar excretion did not manifest itself until a few days after the operation.

The experiments show that, under normal conditions, the thyroid gland exercises an inhibitory influence upon the internal secretion of the pancreas. When the thyroid is extirpated, the inhibitory influence over the function of the pancreas is done away with, and "hyperpancreatism" is the result. Excessive secretion of the thyroid leads to partial insufficiency of the pancreas and to an increased activity of the adrenals.

The adrenals, also, possess a marked inhibitory influence, even greater than that of the thyroid, upon the pancreas, and moreover appear to increase the action of the thyroid.

The observers think, in the light of further experiments, that the vagus nerve and the sympathetic system are in part at least responsible for the conduction of these influences from gland to gland. They found that the glycosuria produced by puncture of the floor of the fourth ventricle was analogous to adrenalin glycosuria, inasmuch as extirpation of the thyroid gland prevented the appearance of glycosuria following this particular injury to the nervous system. The adrenal glands are well known to have a close relationship to the sympathetic system. Not only the adrenals, but also the thyroid, may act as the direct excitant of the sympathetic nerves, for adrenalin mydriasis could be obtained constantly in normal and even thyroidectomized dogs by the feeding of thyroid extract. The thyroid seems, however, to have a double action and influences the vagus as well as the sympathetic nerves.

Further, it seems probable that the pancreas is not only influenced by but influences the vagus nerves. When the vagus was paralysed by the administration of pilocarpin, excessive internal secretion of the pancreas was the result, and injections of adrenalin failed to produce glycosuria. On the other hand, injections of atropin seemed to stimulate the vagus. The function of the pancreas was so much depressed that the effect of thyroidectomy was overbalanced, and the injection of adrenalin in thyroidectomized dogs to whom atropin was administered, gave rise to glycosuria.

In this connection, also, may be cited some recent work by Pemberton and Sweet. They have studied in dogs the effects of the extracts of the adrenal and pituitary body upon the flow of the pancreatic juice after the administration of secretin. Extracts of the adrenals and of the nervous portion of the pituitary body contain some substance that cuts short the flow of pancreatic juice excited by secretin, and prevents the stimulation of the pancreas by secretin when injected before the secretin. Both extracts produce a rise in the blood pressure but the inhibitory action was not due to this factor, for in a few experiments a rise of blood pressure occurred without inhibition of the external secretion of the pancreas. Section of the vagi had no effect upon the action of the adrenal and pituitary extracts. So far as they could see, this inhibitory action upon the pancreas was specific for the adrenal and pituitary body. Injections of extracts of the brain, thyroid, liver, testes, atropin, and digitalis were without effect.

Syphilis.

The studies during the year on the various phases of the subject of syphilis are multitudinous. The conclusions arrived at amply confirm

previous work and support Schaudinn's contention that the spirochæta pallida is the specific agent in this disease. The organism has been found constantly present in the primary and secondary lesions of acquired syphilis, as well as in those of the inherited form. It has been found occasionally in the later manifestations and in gummata. The failure to detect the organism in the late lesions simply means that it is scanty in numbers and, therefore, has escaped observation. Further, there is apparently a direct relationship between the number of spirochætes and the severity of the affection. In congenital lues, where the child dies within a few days after birth, and in the more extensive manifestations in the skin and mucous membranes, the tissues are flooded with them. Pure cultures have not yet been obtained, so that Koch's postulates cannot be complied with in their entirety, but there can hardly be a reasonable doubt that in the spirochæta pallida we have the causal agent in syphilis.

Two points bearing on the diagnosis of syphilis may be referred to in passing. Two or three observers have pointed out that in chronic inflammations of the brain and cord of syphilitic origin, the cells found in the cerebrospinal fluid are altogether mononuclear. The only other affection in which this is the case is said to be sleeping-sickness, a disease that would not likely lead to any difficulty in diagnosis. In tuberculosis, while at one stage there may be an excess of mononuclears, there is always a considerable number of polymorphonuclears present.

The second point has to do with Wassermann's serum reaction for the diagnosis of syphilis. Wassermann, Neisser, and Bruck utilized for this purpose the phenomenon discovered by Bordet of the deflection of complement by an antigen and its corresponding antibody. They found that an extract of the liver of syphilitic infants, together with the blood serum of syphilitics, was able to prevent the solution of sensitized red blood-cells by means of complement. Later, Marie, Levaditi, Weil, Braun, and others, found that the same deflection or fixation of complement took place when extracts of normal livers, extracts of certain tumours, extracts of guinea-pigs' liver were employed. Wassermann, Porges, and Meier then showed that the active substance in the liver extract was soluble in alcohol, and eventually these extracts were proved to be lipoid in nature. Wassermann and his assistants came to the opinion that the substance that caused the phenomenon was lecithin. This would imply that the syphilitic antibody is capable of attaching itself to and causing damage in the cells of the central nervous system, the red blood-cells and other lecithin-containing cells. Fleischmann (Berl. klin. Woch., March 9, 1908) found, on investigating this idea, that lecithin was only

capable of giving a partial reaction as compared with liver extracts. Then, he set himself to determine whether other substances would give the reaction. Mastic emulsion, kaolin, and glycogen gave negative results. Cholesterin and vaseline gave positive results. He concludes that Wasserman's statement that syphilitic products attack lipoid substances still holds good, but that there is no reason for giving lecithin the chief place.

With regard to the diagnostic importance of the test, it seems to be fairly agreed that a positive Wassermann reaction shows an existing syphilitic infection in the body though this is not necessarily progressing. A negative reaction does not contraindicate syphilis. An interesting and important fact is that Lesser, and others, have found a positive reaction in a very large proportion of cases of tabes and general paresis, thus adding great weight to the contention of those who have held that these diseases are usually of syphilitic origin.

Tuberculosis.

The work done in connection with tuberculosis seems largely to have been ploughing over old ground. Questions such as the paths of infection, the effects of tuberculin injection, the diagnosis of the disease by the Calmette ophthalmo-tuberculin reaction, vaccination by von Pirquet's method, and the inunction plan of Morro, are still to the fore. The various tests with tuberculin by external application seem to be generally conceded to be valuable aids in the recognition of tuberculosis.

The feature, however, of outstanding importance was the International Congress on Tuberculosis which met in Washington last October. The great Koch was to be there, and inasmuch as his views on the communicability of bovine tuberculosis to human beings are diametrically opposed to those of practically all investigators on this subject, much interest was felt in the position that he would take. He still stuck to his first position, however, and defended his views with great ability and ingenuity. A special conference was held *in camera* to bring about, if possible, some unanimity between Koch and his opponents, but without avail. The general opinion appeared to be that while Koch, from a purely technical point of view, had much reason on his side, yet it would have been more useful if he had come out squarely in favour of maintaining the present restrictions in regard to cattle, instead of weakening the hands of veterinarians and hygienists by emphasizing unduly points in laboratory technique.

Some work is being done now on the effects of the ferments contained in leucocytes upon bacterial action. One of the more noteworthy papers

on this subject is that of Opie, who found that washed leucocytes injected in the pleural cavity of dogs, who were the subjects of pleural tuberculosis, were competent to delay the evolution of the disease, though they could not prevent it.

Jochmann has tried to determine whether the proteolytic ferments of the polymorphonuclear leucocytes are in any way related to bactericidal substances or to the "microcytase bactericidal alexin" of Metchnikoff, which is by the latter observer supposed to be contained in the polymorphonuclear leucocytes. Jochmann found that the enzymes in question had no destructive effect on living bacteria, nor could they hæmolyze living red blood corpuscles. The enzymes do not act as complement nor do they destroy toxins. The enzymes are capable, however, of digesting dead bacteria, and this probably explains the solution of bacteria that are taken up by the phagocytes.

Vaccine Therapy.

Wright discusses the question of vaccine therapy and auto-inoculation, and gives the conclusions arrived at after extended observation by himself and his pupils. These conclusions are as follows:—(1) Vaccine therapy is applicable not only to localized infections but also to general systemic diseases. (2) Spontaneous auto-inoculation occurs not only in general septicæmic diseases, but also in cases of localized diseases in which the focus of infection has attained a certain development. (3) Auto-inoculation can, in the case of localized disease, be artificially induced by massage, by active and passive movements and by active and passive hyperæmia. (4) Such artificially induced auto-inoculations can be turned to useful account in diagnosis. (5) The success of certain empirical methods of treatment, notably the Bier method, is probably largely dependent upon the fact that they induce adequate and not excessive auto-inoculations. The fact that the determination of the opsonic index requires a more or less tedious manipulation and a degree of skill in the technique, tends with many to minimize the usefulness of of the procedure. This leads Wright to consider the feasibility of achieving the desired improvement apart from the determination of the opsonic index. He concludes that it is not wise to employ the injection of bacterial vaccines entirely in the dark. One must take into consideration variations in the potency of the vaccines due to accidental circumstances, and to the susceptibility of the patients in different degrees of infection. Where one has a visible field of control, as in the case of acne, sycosis, and furunculosis one can to some extent gauge the dosage by the effect, though even here, mixed infections my be present and mask the

result. In concealed lesions, the determination of the opsonic index gives useful and accurate information as to the progress of the case. The inconsistent results of other observers are due either to faulty technique or to lack of patience.

Miscellaneous Observations.

Finally, to conclude a somewhat lengthy disquisition, a few curiosities may be mentioned by way of a "bonne bouche."

Henry and Rosenberger and Lavenson record two cases of acute meningitis due to the typhoid bacillus, in the absence of the usual manifestations of the disease.

Adami has recorded a unique example of a tumour composed entirely of embryonic striated muscle cells. It occurred in a speckled trout. So far as is known no similar example has been recorded.

If anything could be taken as settled in the mind of the average morbid anatomist, it is that the so-called "large white kidney" of Bright's disease is a fatty kidney. This belief is about as firmly rooted as the pyramids of Egypt. This confidence is now somewhat rudely dashed, however. Klotz has proved beyond question that one important type of this form of kidney affection is not the result of fatty change but is due to the presence of soaps, hence the appellation "soapy kidney."

A. G. N.

MEDICINE.

UNDER THE CHARGE OF DRS. FINLEY, LAFLEUR, HAMILTON, AND HOWARD.

RETROSPECT IN MEDICINE.

"Acute Myeloid Leukemia."

In a recent number of the Deutsches Archiv für klinische Medizin (Bund 96, p. 236, 1909), Dr. F. Port of the Gottingen medical clinic presents a most interesting paper and one worthy of the most careful consideration.

The author points out that until the past decade all cases of acute leukemia were considered to be lymphatic in type, because of the preponderance of the large mononuclear cell with non-granular protoplasm. Recently, however, Naegeli and Schridde have shewn that these large non-granular cells may also be the forerunner of the myelocyte, hence they have termed them 'myeloblast.' In support of this contention Schultze, Meyer and Heinecke, Butterfield and others, have reported cases of acute leukemia with a preponderance of the large mononuclear non-granular cell in the blood, but with the post-mortem anatomical

features of myeloid leukemia, namely hyperplasia of the bone-marrow and the presence of myeloid tissue in the spleen, lymph glands, liver and other viscera.

While pathologically the two types of leukemia can be readily differentiated, clinically there is often difficulty. It is now recognized that no dependence can be placed on the greater enlargement of the spleen or the lymphatic glands. Further, the blood smears themselves are not altogether safe criteria. Port does not agree with Schridde, who claims that by special stains the lymphoblast and myeloblast can be differentiated. Nevertheless, in the acute myeloid group there are usually to be found cells—the "promyelocytes" of Pappenheim—which are intermediate between the myeloblast and the true myelocyte. These promyelocytes present with Ehrlich's triacid stain a finely-dusted appearance, due to the very small neutrophilic granulations which are distinctly smaller than those of the normal full-grown myelocyte: with the May-Grünwald stain (which is very similar to Wright's), these cells appear light red, in marked contrast to the pure blue of the myeloblast.

The author reports the case of a male, 41 years of age, who had been under observation for 14 months for petechial hæmorrhages of the skin, without enlargement of the glands or spleen. Subsequent to a severe hæmorrhage from an injury to a finger, the spleen and glands rapidly enlarged and all the symptoms of a severe, rapidly fatal leukemia developed. The entire course was two months. The blood picture showed, in addition to a severe secondary anæmia, a marked leucocytosis (159,400 and later 522,800 per c.mm.), of which 73 to 61 per cent. were myeloblasts, 11 to 13 per cent. promyelocytes, 6 to 10 per cent. myelocytes, 5 to 8 per cent. polymorphonuclear neutrophiles, 2 to 4 per cent. lymphocytes, and 0.8 per cent. eosinophiles. In addition there were a moderate number of normaloblasts, megaloblasts and basophilic erythroblasts. The myeloblasts were cells three to one and a half times larger than the normal red cell, with a nucleus less basophilic than the protoplasm, round or sometimes oval or indented, and lying concentrically or eccentrically. Some nuclei showed 3 to 4 darker nuclear bodies; the nongranular basophilic protoplasm formed a relatively broad band around the nucleus and sometimes contained vacuoles and pseudopodia-like projections. The promyelocytes were mononuclear cells with a red tone to the protoplasm due to the fine neutrophilic granulations as before described. There were also all stages in development between the nongranular cells and the normal myelocyte. The blood picture was therefore typical of a 'myeloblastic leukemia.' The autopsy revealed hyperplasia of the bone-marrow and collections of myeloid tissue in the glands,

spleen, tonsils, liver, lungs and kidneys, in which the myeloblast and promyelocytes were the predominating cell. A moderate number of eosinophilic and neutrophilic myelocytes and erythroblasts were found, with only an ocasional polymorphonuclear neutrophile. The lymphatic tissue was everywhere atrophied, and indeed existed only as 'rests' in the glands, spleen and tonsils.

In conclusion the author discusses the origin of the myeloid foci in the viscera. Banti regards these myeloid foci as metastatic from the marrow by means of the blood stream. Schultze, Ziegler and Helly also believe that they originate in the marrow, are carried to the viscera by the blood current and further develop in the viscera without forming a definite infiltrating tumour-like growth. Port, however, regards the foci in the hæmatopoietic organs (spleen, liver and glands) as developments of pre-existing embryonic relics of myeloid tissue which are stimulated to growth by a specific irritant. He admits that there is no proof that the other viscera in embryonic life contain any myeloid tissue. He then discusses the ingenious claim of Schridde, who believes that the endothelial cells of the vessels of the embryo are the mother-cells of the myeloblast and erythroblast, and that post-embryonically the endothelial cells of all the viscera can under certain conditions (e.g. leukemia) develop into myeloblasts and erythroblasts. Port's chief objection to this theory of metaplasia is that in such conditions as pernicious anæmia the hæmatopoietic organs alone develop myeloid tissue from the endothelial cells of the capillaries, and that such organs as the glomeruli of the kidneys, which are very rich in capillaries, show no such changes.

C. P. H.

OTO-LARYNGOLOGY.

UNDER THE CHARGE OF DRS. BIRKETT AND JAMIESON.

RETROSPECT IN OTO-LARYNGOLOGY.

Fernand Lemaitre & E. Halphen. "Nystagmus and the Internal Ear." *Annales des maladies de l'Oreille et du larynx,* December, 1908.

After a review of the physiology and anatomy of the labyrinth, the authors define vestibular nystagmus as a "bilateral, rhythmical, involuntary and unconscious nystagmus, resulting from two successive ocular movements, namely, a slow movement at first followed by a rapid return." The rapid movement being more marked serves to determine the direction of the nystagmus. Thus, there is nystagmus to the right, when the eyeballs turn slowly to the left, but return suddenly and rapidly to the

right. Following Alexander, three varieties of intensity are described: A mild nystagmus (third degree) only manifested when the eyeballs are in the extreme lateral position: A strong nystagmus (second degree) easily seen when the eyes are in the central position; finally, a very violent nystagmus (first degree) when the turning of the eyeballs towards the extreme lateral position of the opposite side does not cause it to disappear.

The name, "latent nystagmus," is given to this mild nystagmus of the third degree, which in practice is found to be the most common. This latent nystagmus is developed by fixing the gaze, then turning the eyes towards the extreme right or left, and also by looking into distance with the eyes closed or covered with opaque glasses.

As each semi-circular canal reacts after its own fashion, there are three principal varieties of nystagmus, namely: Horizontal, vertical and rotatory.

In the normal condition there is no spontaneous nystagmus, because Deiter's nucleus is not stimulated, or rather the two nuclei, right and left, are equally stimulated, and hence there results a condition of equilibrium, or muscular tone, which influences equally the ocular muscles of both eyes,—but should this equilibrium be broken, then nystagmus will appear, and naturally to the side on which the muscular tone predominates. Thus, when pus first invades the labyrinth nystagmus appears on the diseased side, owing to the increased tone of this side. Later on, when the labyrinth is destroyed, the muscular tone is lost, and consequently there is nystagmus to the healthy or opposite side. At a still later period, the nystagmus disappears altogether, because the healthy labyrinth reduces its tone by exercising an inhibitory function.

In the discussion of mechanically produced nystagmus, Drs. Lemaitre and Halphen base their deductions entirely on Ewald's experiment, which consisted in plugging a horizontal semi-circular canal with lead, and then through an opening in the bony wall, compressing the endolymph, by means of a syringe, and afterwards withdrawing the piston of the syringe, thereby aspirating the endolymph. In the first instance, the direction of the endolymph was towards the ampulla, causing marked nystagmus to the side examined, and in the second instance towards the arc of the canal away from the ampulla, causing a slight nystagmus to the opposite side. The conclusion arrived at was "the direction of the endolymph in a horizontal semi-circular canal from the arc towards the ampulla is a movement of great physiological importance, as it is accompanied by a sharp nystagmus to the stimulated side; whilst the reverse flow, from the ampulla towards the arc, is a movement of not

much physiological importance, as it results in a very mild nystagmus to the opposite side."

It is necessary to be familiar with the above findings to understand the mechanical reflex and to explain the "sign of fistulas." If one exerts a very strong pressure, by means of a Gellé-tube, for example, in an ear, in which the bony labyrinth is intact, there results no movement of the endolymph in the semi-circular canals, and consequently no reflex; but if the bony wall of the semi-circular canal is wanting, if there exists a fistula of this canal, then we obtain a reflex nystagmus; with compression the endolymph flows towards the ampulla, and hence the nystagmus is towards the affected side; with the removal of the pressure, the flow is away from the ampulla, therefore, the nystagmus is towards the healthy side. When the lesion is situated in any other part of the vestibule, instead of in the external semi-circular canal, the sign of the fistulas always exists, but the direction of the nystagmus loses its value. The rotatory, caloric or Barany, and the galvanic methods of eliciting nystagmus are all very minutely described. In the first two methods, the determining factor in producing the nystagmus is the direction of the endolymph current, as in Ewald's experiment. Thus in the rotatory method, in turning a patient from right to left, the endolymph in the right ear is driven towards the ampulla causing a marked nystagmus to the same side, i.e. the right; while in the left ear the endolymph is forced from the ampulla towards the arc, causing a slight nystagmus to the opposite side, i.e. the right, where it joins and reinforces the important nystagmus due to the stimulation of the right labyrinth. Consequently to examine a semi-circular canal, it is necessary to turn the patient towards the opposite side and examine the eyes when rotation ceases. In Barany's test, the temperature of the water determines the direction of the endolymph and consequently the location of the nystagmus. The anterior vertical canal is the one usually affected by the caloric method, and the nystagmus is generally rotatory. Cold irrigation in the neighbourhood of the labyrinth causes the endolymph in the vertical canal to flow towards the ampulla whilst hot irrigation reverses the flow from the ampulla towards the arc. Hence both produce a nystagmus, with cold water to the opposite side, with hot water to the same side. The authors here admit that they are unable to explain the direction of the nystagmus.

In both the above methods, the other semi-circular canals can be tested by altering the position of the head, but it must be remembered that then the direction of the nystagmus varies.

As the actual mechanism of the reflex nystagmus in the galvanic

method is very obscure, it may be dismissed by remarking that the nystagmus appears on the cathode side. Passing on to the suppurative affections of the labyrinth, a great distinction is made between acute suppurative, and acute serous labyrinthitis. In the first case, there is destruction demanding surgical intervention, while in the second case there is only irritation, which can be adequately treated by careful medical measures. Between these two extremes are many intermediate conditions which call for no active treatment other than careful observation.

In chronic suppuration of the internal ear there is no spontaneous nystagmus because the sound labyrinth exerts an inhibitory influence on its muscular tone to equal the changes in tone of the diseased side. The chronic forms of labyrinthitis are divided into chronic suppurative with destruction, and chronic serous with irritation, the treatment of which is similar to that of the acute form.

The integrity of the cochlea is considered a contra indication to trephining the labyrinth, while the following triad of symptoms, viz: absolute deafness, marked loss of equilibrium and the complete abolition of the nystagmus reflex, are a definite indication to open the internal ear.

To differentiate between cerebellar abscess and labyrinthitis it is necessary to try the various tests to elicit the nystagmus reflex. If the findings agree with the clinical signs of a lesion of the labyrinth, then a diagnosis of an internal ear lesion may safely be made; but if, however, the nystagmus reflex is at variance with the vestibular symptoms, then we are forced to a diagnosis of cerebellar abscess.

This differential diagnosis is only possible in the presence of a unilateral auricular disease. The authors further elucidate the above question by hypothetical cases and plates. In non-suppurative affections of the ear, the value of the nystagmus reflex is equally striking. By it, one is able to tell in oto-sclerosis whether the pathological process has or has not invaded the internal as well as the middle ear, and in a case with vertigo, whether this latter is due to intra or extra-auricular causes.

As regards deaf-mutism, there is no vestibular reaction if the lesion is congenital, but a mild reaction if acquired. The important conclusion here is that the congenital deaf-mute can be taught by the system of Abbot-of-Epee, and the acquired deaf-mute by the re-education system.

The importance of developed nystagmus in neurology depends on the fact that it is a reflex, consequently every central lesion that invades the labyrinthine paths, and every peripheral lesion that invades the eight pairs of cranial nerves modifies the nystagmus reflex.

Drs. Lemaitre and Halphen close their paper with the following conclusions:—

1. Elicited nystagmus is a reflex which shows the condition of the vestibular paths, as the patella and achilles reflexes show the condition of the cord and peripheral nerves.

2. It throws a new light on the pathology of the internal ear, and enables one to dispense with the old and vague terms "Ménière's Syndrome," "Raymond's Syndrome" and "Labyrinthism."

3. It permits the use of the words "hyper- hypo- and ana-labyrinthitis" in the cases where the clinical signs are such, that the exact diagnosis of the lesion cannot be determined (acute labyrinthitis, hemorrhage of the labyrinth, etc.).

4. The nystagmus reflex is of the utmost significance to the otologist, neurologist, and medico-legal expert.

The otologist sees the why and wherefore of the old and classical rule not to syringe the ear with hot or cold water; understands better the pathology of, and recognizes at its onset suppuration of the labyrinth; is able to differentiate between cerebellar and internal ear suppuration on the one hand, and congenital and acquired deaf-mutism on the other.

5. The neurologist has a clearer insight into the paralysis of the eight pairs of cranial nerves, and can diagnose between a lesion of its cochlear and vestibular branches; and finally can determine the bulbar or peripheral origin of deafness occurring during the course of tabes.

6. The medico-legal expert possesses an important control test for all the subjective phenomena, as deafness, tinnitus, vertigo, nausea, etc., of involvement of the labyrinth.

As mechanically produced nystagmus is involuntary, it is of great help in the appreciation of cranial injuries.

7. Though this new reflex may not live up to all its promises, but diminish in importance in the future, still it shall have had the merit of reviving the curiosity of the specialist, and of occasioning much patient work and research.

James T. Rogers.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The thirteenth regular meeting of the Society was held Friday evening, April 2nd, 1909. Dr. G. P. Girdwood occupied the chair in the absence of the President.

PATHOLOGICAL SPECIMENS.

THROMBOSIS OF CEREBRAL SINUSES AND VEINS.

Oskar Klotz, M.D. The specimen we have before us was obtained from a young woman, aged nineteen, who had a short time previously been confined. On the day previous to her death, blood cultures were taken, all of which proved to be sterile. At autopsy there was evidence in the uterine wall of small and localized septic processes in the nature of encapsulated abscesses. One of these was directly beneath the serosa on the anterior wall of the uterus and had caused a slight inflammatory exudate between it and the bladder. In other respects the uterus showed nothing remarkable. The blood vessels and various organs showed no evidence of a septicæmic process at the time of autopsy. In the brain, however, a remarkable condition was encountered. The left lateral sinus, beginning at a point half an inch from the descending portion, was thrombosed by a grey clot as far as the torcular Herophyli. From here the thrombus extended into the straight sinus, crossing the tentorium and into the great vein of Galen. From this vessel thrombi could be followed into the various tributary branches which form this vein. Thus it is seen that the left superior cerebellar and the left inferior cerebral veins were occluded, while passing forwards the veins of the choroid plexus and the veins of the corpus striatum were completely plugged. It was also seen that the veins passing over the optic thalamus and caudate nucleus on the left side were occluded. As a result of this extensive thrombosis the corpus callosum throughout its extent was softened and broken down, and nothing but a soft debris remained of the septum lucidum. In the left hemisphere the optic thalamus and the caudate nucleus showed extensive disintegration, and the process of softening was also present in the internal capsule and corpus striatum of this side. On the right side the degenerative processes were not so marked, and beginning softening was only to be noted in the optic thalamus and the corpus callosum. On this side the internal capsule and corpus striatum were undamaged. With the extensive softening that had taken place in the left hemisphere many petechial hæmorrhages and evidence of thrombosed capillaries were to be seen in the substance about the ventricles. And, further, there had been a fair amount of hæmorrhage into the left lateral ventricle. In looking at the left hemisphere from its inner surface the extensive degree of this disintegration of brain substance is readily appreciated.

It is most probable that at a previous date this patient had suffered from a septicæmic process, which had cleared up, save for the localized abcesses in the uterine wall and the progressive thrombi in the sinuses

and veins of the brain. The degenerative processes in the brain substance were of the nature of softening and not abscess.

The autopsy findings in the other organs showed that the patient had also suffered from toxæmia of pregnancy. The liver showed numerous focal necroses in the central and mid. zones of the lobules, while in the kidneys there was evidence of a mild parenchymatous nephritis.

Dr. H. M. Little. With reference to this specimen of the septicæmia I would say that the patient came into hospital with almost complete suppression of urine and in the eclamptic state. With a view to emptying the uterus a bougie was introduced and labour pains were started. Dilatation was comparatively easy, and she was delivered without much difficulty. She was given large quantities of water with a view to dilute the toxine, and she apparently recovered from the eclampsia. Possibly the abscess in the wall may have been due to the introduction of the bougie, but her temperature was never high. The condition is extremely interesting; it started as a case of eclampsia, from which the patient completely recovered, and later when she was well and sitting up developed this hemiplegia.

A. Lapthorn Smith, M.D. Dr. Klotz's specimen of uterus is of interest in that now the view is gradually gaining ground that accouchement forcé is a very dangerous operation, while Cæsarean section has been growing safer and safer until now it has a death rate of only 1 per cent. if done by an expert on women who have not been infected by efforts at delivery. I am only saying this to prepare the mind of the physician to look upon this as the proper thing to do in a dangerous case of eclampsia. The uterus must be emptied as soon as possible, everybody agrees about that; but the former method of treatment by accouchement forcé or with powerful drugs like Chloral Hydrate or Chloroform, which have a high record of deaths on this continent at least, must give way to Cæsarean section, which is so safe that Dr. Barton Cook Hirst told me, about this time last year, that he had performed his seventy-fourth consecutive case without a death. But of course they were done before any injury had occurred to the genital canal. Evidently in the case before us the patient did not die from the eclampsia but from the treatment for that eclampsia; and the sooner that treatment is replaced by Cæsarean section it will be the better for everybody.

1. CARCINOMA OF THE PROSTATE. 2. PRIMARY CARCINOMA OF THE LIVER.

R. P. Campbell, M.D. 1. This specimen was obtained from a patient who had been operated on for hypertrophied prostate by the suprapubic method, and who subsequently came to autopsy when the disease was

found to be carcinoma. The specimen is of interest as showing the manner in which the metastases occurred, that is, between the vesicles, up along the anterior wall of the rectum. It also shows the cavity which occurs after suprapubic enucleation. There is a trabeculated bladder, much inflammation, and hydronephrosis with dilated ureters.

2. Primary cancer of the liver is extremely rare, and we have to rely largely upon the macroscopical findings and a careful search of the body. In this case we were unable to find any primary focus whatever, nor any manifestations of disease other than those in the liver itself. The patient was 67 years of age and died with all the symptoms of portal obstruction. The microscopic sections support the probability of the new growth originating in the liver, but the strongest reason is that after a very careful search in an autopsy, where this was possible, we failed to find any trace of a primary focus.

CONJUNCTIVAL FLAP IN OPHTHALMIC SURGERY.

W. G. M. Byers, M.D., read the paper of the evening.

G. H. Mathewson, M.D. Dr. Byers is to be congratulated on this masterly exposition of this method, which must strike even the general practitioner as being eminently practical. The use of the conjunctival flap in operative procedures on the eyeball, especially in the extraction of cataracts, has been in vogue for a good many years, and in all places where this has been done the results have been ever so much better, the vascular flap adhering almost immediately, which greatly lessens the danger of infection. Dr. Byers mentioned that Dr. Buller did a modification of Mule's operation, employing two sets of sutures, one on the sclera and one in the conjunctiva. Dr. Buller's great point was that instead of leaving a round opening in the sclera he made an oval one, and so got two flat surfaces to be opposed to each other, which united much more readily than if you left a round opening. He used, too, to make a conjunctival opening in performing discission. He used to introduce the needle primarily through the conjunctiva just outside the cornea. These, however, are only details, and I would once more congratulate Dr. Byers on his excellent paper.

Fred. T. Tooke, M.D. I should like to add how much pleasure I have derived in listening to Dr. Byers' paper. As Dr. Byers admits, there are a number of methods which he can hardly claim as original; yet on the other hand there are other procedures of resecting the conjunctiva which, in so far as I am aware, are entirely original. I have been particularly fortunate in having been associated with Dr. Byers in a number of cases where these methods were particularly called for, and

have been able to appreciate from practical experience a great many of the advantages which a routine practice of the principles laid down in this paper assures. The work on the vascularization of an avascular membrane, for which I believe I am responsible, and to which reference was made, applies quite as well to the conjunctiva as to the iris, and, as anyone interested in ophthalmic pathology will admit, is substantial support to a great many of the practical features which have been brought forward in this paper.

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ON OBSTETRIC NURSING.*

BY

H. M. LITTLE, M.D.,

Lecturer in Obstetrics, McGill University, Montreal.

I have decided to speak to you about certain obstetrical methods, with particular reference to those in vogue at the Maternity Hospital, and to show, if possible, good reasons for their existence. Indeed, a limited experience with general work, outside the Hospital, makes it difficult for me to speak of many of the relations of nurse to patient; but I would remind you, that with your potentialities, obstetric nursing offers the widest scope for the exercise of the Golden Rule.

Obstetric nursing differs from other nursing in that the illness itself does not usually begin with the onset of labor. The patient has for the greater part of nine months been under a tremendous strain, which increases as she approaches an ordeal more fatal in its direct consequences than the acquisition of any disease, save tuberculosis.

The obstetric nurse is usually engaged some months in advance of the expected confinement. If this time could be devoted to a certain physical care of the patient it would do much to help the course of things later on, and also do away with that reliance on purely social intercourse, which is as unsatisfactory for the patient as for the nurse. It is to the nurse's interest to know something of the past medical history of the patient, and possibly of that of her family. For example, a previous history of nephritis is important in connection with toxæmia; while hereditary tendencies to hæmorrhage or mental derangement are also important. I wish nothing I may say to be considered as countenancing that most aggravating practise of prescribing by the nurse, but, particularly when engaged early, she may be consulted and give helpful advice on many things considered too trivial for the attention of the physician.

It is in the interest of patient, nurse and physician, that a preliminary examination be made some weeks prior to the expected confinement.

*An address to the Nurses' Association, April 6th, 1909.

Even apart from this examination by the physician, each nurse who makes a specialty of obstetrical work should know at least the meaning of pelvic contraction, and be able to judge roughly whether any pelvis is normal or abnormal. Any of you who have observed at all closely, have noted the effect of the pelvis on the way in which the child is carried during pregnancy; and all should know the old dictum that a pendulous abdomen in a first pregnancy means a contracted pelvis, or at least disproportion between the fetal head and the pelvis. Ability to hear and count the fetal heart, an accomplishment requiring only a little training and practise, may often save the life of a child that would otherwise be sacrificed. Further, a rough estimation of the size of the outlet of the pelvis, which can be made during the preparation for examination, may determine the possibility or probability of laceration of the perineum and the necessity for preparing instruments and material for repair.

You will hear and read a great deal about threatened eclampsia, about albumen in the urine and about the diminution of urea, and of the necessity for advising the physician should these conditions arise. Now this is all very well, but we are apt to forget that these three conditions are evidences, often imperfect evidences, of a general toxæmic condition which may be manifested first in headache, nausea, vomiting, swelling of the feet, or alteration in the character of the pulse, symptoms obvious to those who have had the most meagre training. It seems unnecessary to remind you that the pregnant woman is peculiarly liable to disorders of metabolism from the fact that she is ingesting, digesting, and excreting for two individuals; and that more important than active treatment is prophylaxis, in which you may do your part by insisting on good food, aiding good digestion and free diuresis and catharsis. The bowels may be stimulated by fruits, while as a diuretic nothing is better than the drinking of large quantities of water. Many conditions, all closely allied, such as toothache, salivation, heartburn, pruritis, for which there is no specific remedy, are all favourably influenced by those factors which go to make up the general health.

Apart from these special conditions it may be wise to say a word about hæmorrhage, which early in the pregnancy suggests the possibility of impending abortion, and in the later months the possibility of placenta prævia. It is always a grave symptom and one that calls for immediate attention. In rare instances women menstruate during their pregnancy, but these are important only on account of their rarity.

With regard to the conduct of the nurse during the labor two points have seemed worthy of mention, firstly, a familiarity with the anatomy of labor, and, secondly, that bearing down is of no avail if the cervix

is incompletely dilated. Due consideration of these points would prevent much misguided help to the patient which—as the aid in bearing down—so often results in serious laceration of the undilated cervix, or in the marked descent of the uterus with resultant rectocele and cystocele. Then, too, you should know and keep constantly before you the fact that too early operation will result in far more harm than good. On the other hand we should realise that too long labor results in a permanently relaxed condition of the overstretched abdominal muscles, and that the retention of the head upon the perineum will not only make a tear more probable but will render its repair less possible. Careful watching of the patient and child will give the mother a feeling of confidence.

Exhaustion of the mother is best evidenced by the change in pulse and temperature, while in asphyxiation of the child there is to be noticed a change in the fetal heart rate. A diagnosis of trouble, based upon the observation of the irregularity of the fetal heart rate, is extremely gratifying to the attending physician and is always possible for any nurse of average experience and ability.

In preparing the patient for operation, or for vaginal examination, our practise has been considerably criticised, chiefly in two respects; first, the vulva is shaved; second, no preliminary vaginal douches are given. It has been said that in one respect we are over-cautious and in another lacking in caution. Since we began the use of a safety razor, non-union of perineal repairs in clean cases has been of the greatest rarity, while before this, non-union was no exception. It is evident that an accumulation of blood at the vulva offers a most excellent medium for the growth of bacteria, and where the patient has not been shaved the more vigorous manipulation is necessary to keep the vulva clean, the worst possible thing for a uniting wound. No patient either public or private has objected to the procedure when its object was explained.

Vaginal douches have been discarded as unnecessary as well as unscientific. It is accepted that organisms capable of causing puerperal fever are not present in the vagina, and the introduction of a douche nozzle is therefore unnecessary in clean cases, while even where the secretion is abnormal a certain amount may be washed away, but more will probably be carried up by the douche into the cervical canal and into the uterus.

This danger of carrying up infection should also be remembered in giving post partum douches, and in my own cases I have never so far as I can remember used a douche immediately after delivery, believing that the introduction of the douche nozzle into the uterus is dangerous and

copious bleeding has a better effect than the douche, so far as cleansing the cavity is concerned.

The use of rubber gloves has passed the stage when it was considered a fad. Often when called to a case it is impossible to thoroughly scrub and sterilize the hands, and the nurse should carefully guard against the possibility of infection, which when it occurs is often wrongly credited to her account. It should be unnecessary to warn you of the danger of vaginal examination. So much do we believe in vaginal examination as a cause of fever, that in the past six months I have made no vaginal examination in normal cases delivered in the Maternity Hospital and have depended on external palpation and a rectal examination when necessary to determine the dilatation of the cervix, using, of course, a rubber glove, which was used for no other purpose and which was sterilized by boiling immediately after being used.

A strong believer in the simplification of matters connected with the technique of delivery, I would, however, like to say a word with reference to the conduct of obstetric operations in private houses. The too firm adherence to the possibility that labor is physiological and that operations, in cases of delayed labor, should be made as simple as possible, results often in serious harm to the patient and damage to the reputation of the physician and nurse. In all cases, apart from perhaps very simple forceps operations on multiparæ, a table should be used when an operation is undertaken. It is my firm belief that practically no serious operations, and indeed comparatively few operations, such as low forceps, can be performed without lacerations which require suturing. Indeed in a large proportion of cases, classed as low forceps operations, the necessity of the operation is dependent upon the narrowness of the pubic angle which throws the head far back on the perineum and renders delivery impossible except at the expense of laceration of the perineum. Moreover, operative cases are more liable to bleed than are normal cases, if for no other reason than that the uterus has become tired out in attempting to overcome some obstruction to the birth. Now while it is possible that the child may be delivered with the patient on a bed, or at the side of a bed, this position is not adapted for the proper suturing of lacerations nor the control of hæmorrhage, should it occur. A small table is always available and the patient can be put into position more satisfactorily with the so-called Kelly strap, which costs but a few cents, than with any other appliance that I have seen. Its adjustment is simple, it holds the patient steady and allows the nurse, when no assistant is present, to give her whole attention to the operation without the fear of the patient becoming free from her supports.

Most physicians knowing the tolerance of the pregnant woman for chloroform are, I fear, rather careless in its use. If it is given slowly, drop by drop, there is little danger, and that danger when present is, I have found, always evidenced by a slowing of the pulse, which may become 60 or less. Whatever the danger in ordinary anæsthesia, this slowing of the pulse is usually the first danger sign when it is given in obstetrical practice.

If you are called upon to deliver a patient in the absence of a physician your attention should be directed to the prevention of infection, to the prevention of unnecessary lacerations, and to the prevention of other accidents, the gravest of which is hæmorrhage. The necessity for careful asepsis has already been considered.

The best safeguard for the perineum is the slow descent of a well flexed head. Passage of the head through the vulva may be compared to that of a foot and ankle through a small cylinder. The small fontanelle, the large fontanelle and the neck may be compared to the toe, heel, and instep of the foot. It will be seen that pressure with the thumb downward upon the toe, and with the fingers upward against the heel until the instep has passed the lower plane of the cylinder lessens the danger of impaction and facilitates egress. Pressure made with the thumb upon the small fontanelle and with the fingers against the large fontanelle, until the neck is well in the symphysis pubis, will minimise the danger of tearing when the head descends. After the head is born, unless there is evidence of asphyxia on the part of the child, wait for further pains before attempting extraction. If the cord is about the neck and too tight to allow the passage of the body, through the loop, it may be necessary to cut it, and for this purpose a pair of sterile scissors should be at hand. Needless to say the portion of the cord attached to the child should be tied as soon as the birth is completed. After respiration has been established by means of a few brisk slaps upon the buttocks of the child, your entire attention should be devoted to the mother. If the fundus is watched carefully, and not actively handled, there is no danger for the mother so long as the uterus remains below the level of the umbilicus; a rise above the umbilicus suggests that the placenta has separated, and if this is so friction will induce pain which, with bearing down by the patient, will usually cause spontaneous expulsion. Under no circumstances pull on the cord, nor, after the placenta is born, pull roughly at the membranes, which can nearly always be brought away intact by slowly rotating the placenta. In all cases the placenta and membranes should be saved for the inspection of the physician. After the birth of the placenta is the proper time for massage

of the fundus, and firm contraction of the uterus is the only preventive of hæmorrhage into the uterus, which is always alarming and sometimes fatal. The administration of ergot will aid in keeping the uterus well contracted. Remember that brisk hæmorrhage after the completion of the third stage is always dangerous, and in these cases do not wait but send at once for the nearest physician.

While serious infection is nearly always preventable serious hæmorrhage may not be preventable, and as the nurse shares the blame, no matter what the complication, it is well to be prepared in advance and to have ready anything that may be required should hæmorrhage occur. Dangerous post-partum hæmorrhage is a most rare condition, if the labor is properly conducted; but I know from experience in the Maternity Hospital and elsewhere that hæmorrhage is to be expected when the labor is not carefully conducted, and the nurse should be careful to avoid any responsibility by having on hand all possible requirements for its control. In the absence of the physician, while it may be unwise to attempt local treatment, the administration of salt solution per rectum, the elevation of the pelvis, tight bandaging of the limbs and often compression of the abdominal aorta are simple measures with which each of you should be familiar.

Catheterization of the patient immediately after the completion of labor is a minor point, but one which is, I think, worthy of your attention. If the labor has been long it is possible that the bladder contains a fairly large quantity of urine, and the necessity for emptying the bladder may prevent the patient obtaining the necessary sleep. Moreover, even where there has been no laceration of the perineum there are often small lacerations about the urethra which are very irritable and may cause retention unless allowed to heal, which they will do if left alone for a few hours after the delivery.

The patient should void within 12 hours, and the quantity voided should be noted. The passage of but one or two ounces means either insufficient secretion or that the bladder is full and overflowing, a condition associated with marked displacement of the fundus. By the reduction and breaking down of the uterus, most marked towards the end of the first week of the puerperium, there is thrown into the circulation a large quantity of material which must be excreted by the kidneys, and this excretion is favoured by the drinking of large quantities of water. The output of urine is one of the best indexes of the general condition of the patient and for this reason the amount should be measured for 8 or 10 days.

The fundus of the uterus should always lie below the level of the umbilicus, and its displacement upward or to either side calls for at

once an examination of the condition of the bladder. Catheterization should be avoided wherever possible, and where there is no serious laceration of the perineum the patient may be allowed to sit up to void.

The toilet of the vulva during the puerperium should be as simple as possible. Frequent change of the absorbent pads makes copious irrigation unnecessary, and apart from careful bathing away of coagulated blood the only cleansing necessary is to pour over the vulva, after urination or defecation, hot sterile water, boracic or a weak antiseptic solution such as 1-10,000 bichloride, and to dry off the excess of this fluid with sterile absorbent. It is unnecessary, and where there are sutures it is dangerous, to separate the labia widely and to give copious vulvar or vaginal douches.

Evil odour of the lochia suggests mild, so-called sapræmic, infection; in the most severe infections there may be no unusual odour to the lochia. The reason for this is that the more virulent organisms attack live tissues, while others, less virulent, live on dead material, clots or fragments of placenta or membranes, which thus undergo putrefaction. When the lochia is foul the odour may be improved by a vaginal douche, but as the vaginal douche does nothing to remove necrotic tissue from the uterus, its favorable effect is chiefly the prevention of stagnation of the lochia in the vagina, though possibly it may also have a good effect by inducing uterine contraction. Better results will be obtained from flushing the uterus with some aseptic fluid, but in view of the serious complications which frequently arise after the administration of an intra-uterine douche this operation should be performed by the physician and not by the nurse. Where there is no rise in temperature, and the lochia is normal, but where the uterus is slow to regain its position in the pelvis, hot vaginal irrigations together with the administration of ergot, by mouth, are of the greatest benefit.

It is the custom in Canada to keep patients in bed for from 10 days to 3 weeks after confinement. Many patients are, however, compelled to be up and to resume their usual work after a much shorter period, and it is interesting to note that in the German hospitals excellent results have been obtained when patients are allowed out of bed early in the first week, often within 24 hours after the confinement. When allowed up early it is imperative that they should not move about or under any circumstances do ordinary household work. Experiments at the Maternity with this early rising have indicated its great value, particularly when the patients are kept under careful observation: the result at the end of two weeks has been equally satisfactory, if not more so, than when the patient remained in bed for the usual ten days.

Whether allowed up early or late it is of equal importance that the abdominal wall be supported by a well fitting corset or a binder. While the patient is in bed the question of wearing a binder is debatable.

The history of the binder is interesting. It is probable that the binder was first introduced as a means of irritating or massaging the fundus of the uterus. In some countries the bark of trees is placed upon the abdomen, while in others the placenta is used for the same purpose. The first large binder was made from the skin of a black sheep, flayed alive, which, powdered with roses and myrtle, was placed over the abdomen and the lumbar regions. This was supposed to have a very marked effect in stimulating uterine contractions. Upon the occasion of the confinement of the Dauphine, Anna Marie Victoria of Bavaria, in 1652, a lamb which had been flayed in an adjoining room followed its pelt into the confinement room and caused such consternation among the ladies of the court that this custom was discontinued.

It is true that the Aborigines wore a binder, but this was applied by the patient herself after she had left her bed. One end of the binder was caught by a door or other convenient piece of furniture and the patient holding the other free end, gradually wound herself into the material. Note that it was applied after the patient was up and about. At the present day the binder is used very largely in England and in Canada, used less in Germany and used comparatively little in France and in the United States. It is true that there has been somewhat of a reaction in favour of its use in Germany, based on the fact that many of the patients have what is commonly known as "hangebauch," but, as has been pointed out, this has been due to too early rising rather than to the lack of binding. In Japan the binder is not used while the patient is in bed, but is used during the latter part of pregnancy and again when the patients begin to move about after the confinement, the result being very satisfactory.

Against the binder it has been urged that it (1) interferes with the action of the intestines, (2) prevents involution of the uterus, and (3) that it is not clean; and further, that its use prevents a close observation of the involution of the uterus. In its favour has been urged that (1) it is a comfort to the patient, (2) that it has a beneficial effect upon the intra-abdominal pressure, and (3) that it aids in preserving the figure of the patient. Hermann, of London, after investigating these last three contentions concluded that the binder has absolutely no effect upon the preservation of the figure, in which he was anticipated by the great French physician Mauriceau by about 200 years. He concluded that it was absolutely useless in the prevention of hæmorrhage, and where too

tight pressure was made it had a marked effect in causing displacement of the uterus. Remember then that the binder is a help in the latter part of pregnancy, that if loosely applied it can do no harm while the patient is lying on her back, but under any circumstances it should be used when the patient begins to sit up and particularly when she stands and begins to go about her work.

The care of the breasts is one of the most important features of the care of the patient. No other complication of the puerperium is more painful than fissured nipples, the sequel of which too often is absence of the breast.

During pregnancy much can be done by prophylactic massage of the nipple and the application of some emollient with, later, some such fluid as a mixture of alcohol and witch hazel. After the child is born great care is necessary, particularly during the first few days when there is very little food for the child and consequently greater irritation of the breast by the child; at this time one may either apply an ointment or keep the breasts and nipples clean by means of a saturated solution of boracic; the latter is simpler and probably cleaner. If the nipples are tender but not cracked the application of the silver solution will greatly relieve the tenderness; while, if deep fissures develop, nothing gives such satisfactory results as cauterizing these with silver nitrate crystals, or a silver stick, and then anointing with a mixture of Balsam Peru and lanoline 1 in 8 to which 10 per cent. of Argyrol is added. The early care of the nipples will minimize the possibility of abscess formation, but you cannot be too much on your guard when lumps appear, and these should be reported at once to the physician. I would warn you against the common and indiscriminate use of the breast pump, which aggravates the condition it is sought to relieve. If the breasts are engorged the pump stimulates them to still further engorgement and is extremely dangerous even when carefully used.

When it is necessary to dry up the breasts, leave them absolutely alone save for the application of a supporting binder, which is all that is necessary to check the secretion of milk. The administration of strong purgatives is not necessary nor is it necessary to diminish the quantity of fluid given. After the first 24 hours the breasts become turgid and are rather painful, but this pain may be relieved by the administration of some suitable anodyne, and the patient may be assured that within 24 hours the engorgement will be decreased and the breasts will become soft and painless.

In the event of abscess formation, or where the incising of the abscess has resulted in such scarring of the breast that the milk does not flow

properly, the child may be nursed from one side, and by leaving the affected breast absolutely alone much trouble may be averted.

There are certain particulars in connection with the new-born child that have much direct bearing upon the health of the mother. In the first place the installation of silver nitrate into the eyes of each and every baby born under your supervision can do no harm, provided it is assumed to be done as a matter of routine, and may save much trouble later.

The care of the cord is also important and here there is but one caution, keep it dry. An excellent dressing may be made of starch and boracic with 30 grs. calomel added to each ounce. If the dressing is changed frequently and not allowed to remain too long the cord will dry and come off about the eighth day. Should it become moist, this fact should be reported at once to the physician.

If the bowel movements should cause irritation of the skin about the anus, a mixture of olive oil and lime water should be used after each bowel movement and soap and water should be avoided. The child should nurse regularly by the clock and for a certain definite time. Personally I believe that infants, unless much below the average weight, can be trained to sleep from 10 at night to 6 in the morning without doing them the slightest harm; any disadvantage upon the baby may be compensated by the excellent effect upon the mother. This clock regulation is not a fad, it is something conducive to the comfort of the family in that the child does not cry to be fed, while injudicious and ill-timed feeding results in chronic irritability.

PSYCHO-ANALYSIS IN PSYCHO-THERAPY.

BY

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The evolution of psycho-therapy, like that of all other modes of treatment, is marked by an ever increasing precision in method and an ever deepening comprehension of the conditions to which it is applicable. Progress in these two respects must always go hand in hand, for the moment therapeutics becomes divorced from pathology and diagnosis it leaves its scientific basis and stands in danger of approximating to that medical charlatanry which it is the highest interest of our profession to resist. The two studies are peculiarly interwoven in the case of the psycho-analytic form of psycho-therapy, for, as I shall presently indicate, treatment is here carried out by simultaneously laying bare and remedying the pathological mechanisms at the basis of the malady. From this point of view we can discern two stages in the development of any new method of treatment, and these I can best illustrate by a reference to more familiar methods, for instance the operations of trephining or of laparotomy. When the possibility of these operations was first realized we saw the first stage in development, in which, namely, they were regarded merely as an adjunct to the therapeutic armamentarium, and were applied in the relief of conditions that were already well known and studied on established pathological lines. The second stage arose when, through the repeated performance of such operations, conditions that could be relieved by them came to be studied anew, fresh aspects of pathology opened up, and questions of precise diagnosis that had previously been academic problems of trivial interest now became urgent matters of life and death. A moment's reflection on the history of appendicitis will remind you of how little we knew of the pathology, the diagnosis or even the existence of the affection until the surgeon's knife shewed that it could be cured. We might, in fact, paraphrase the motto underlying British Imperialistic policy, to wit, that Trade follows the Flag, and say that in medicine Diagnosis follows Treatment.

Now in psycho-therapy most of the medical world is at present only entering on the first stage. That the medical world of America will definitely enter on this stage as a prelude to further advancement will, I trust, be one of the results of this afternoon's conference. In this stage we clearly recognize that we have secured a new therapeutic weapon of

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the utmost value, which we may describe as the capacity to alleviate certain complaints by purely mental measures, in other words as psycho-therapy in its broadest sense. Our attitude towards the nature of these complaints, however, remains in this stage substantially the same as it was when they were treated only by physical remedies. Hence we may see the strange picture of a physician removing by verbal suggestion a symptom which he considers is produced by a toxin circulating in the blood. However, a thoughtful person who employs any form of psycho-therapy soon realizes that a symptom which can be removed by mental measures is in all probability of a mental nature. It may parenthetically be remarked that he further realizes how the suffering endured by the patient, so far from being unreal, is all the more dreadful and formidable for having a mental and not a physical origin. A non-appreciation of this important fact is still all too common. Only recently an article appeared in one of the leading medical journals in which the writer remarked: "In this manner I hope that we will always be able to trick a malingerer or hysterical subject into betraying the falsity of his claim." This attitude, though rarely in such an outspoken form, is frequently implicit in medical writings, and cannot be too strongly condemned. Apart from yielding an inkling of the mental nature of various disorders, the first stage in the evolution of psycho-therapy is characterized by an indeterminate attitude towards the origin and pathogenesis of them. The older conceptions have begun to dissolve, but the knowledge won by the new method of treatment has not yet been formulated. Psycho-therapy is in this stage employed in a quite empiric way, and the physician either does not concern himself with the intrinsic *modus operandi* of his treatment, or else offers explanations of it which are so superficial as to be of little scientific value.

Psycho-analysis represents the second stage in the evolution of psycho-therapy. Here a deeper insight is sought into the essential nature and origin of the morbid phenomena with a view to obtaining a fuller understanding of the aims of treatment and so to achieving a greater precision in the application of it. The psycho-analytic method we owe almost completely to the genius of Professor Freud of Vienna, who in the past sixteen years has wrought it into an elaborate science of which I can here give only the most summary outline. The method is based on the knowledge that the symptoms present in the psycho-neuroses owe their origin to a conflict between different groups of ideas or mental processes which cannot be brought into harmony with one another. One complex of mental processes is for some reason or other of such a kind as to be inacceptable to the main body of the personality.

The personality fails to assimilate it, will have nothing to do with it, tries to forget it, to submerge it, to "repress" it. The "repressed" complex then takes on an automatic existence, and acts as an irritating foreign body in the same way as any physical foreign body that has not been absorbed. From this point of view we may define the pathology of the psycho-neuroses as a *defect in assimilation.*

Let me illustrate my meaning with a concrete instance. A man conceives an attraction towards the wife of a near friend or relative, and in his imagination perhaps plays with the thought of what might happen were the friend to meet with a fatal accident. If he honestly faces his wish and realizes its nature he will instantly see that, though possibly a perfectly natural one, it is of such a kind that for social and ethical reasons it must obviously be suppressed. If he adopts this healthy attitude he will probably think no more about the matter except in the most harmless way. The wish-complex is here assimilated by the main body of the personality. If on the other hand he regards the mere possibility of entertaining such a wish as a sin and a sign of the most desperate iniquity he may refuse to own up to himself that he has ever felt it, even momentarily; whenever the thought occurs to him he endeavours to put it from him, to get way from it, in other words to *repress* ("verdrängen") it. The complex here is not assimilated, it therefore continues to act, and the more the man strives to escape from it, the more hauntingly does it torment him. He has now become the prey to a fixed idea which is out of his control, and which evinces its independence by appearing irregularly whether he wills it or not. In actual practice we never meet with cases so simple as this, but the instance will serve to illustrate the notion I am trying to convey, namely that certain mental processes, particularly strivings, desires and impulses, if they are not absorbed in the main stream of the personality are apt to manifest an independent activity out of control of the will. This activity is usually of a low order, of an automatic and almost reflex kind, and—if I may be allowed to use the term in a clinical and non-philosophic sense—it is generally an *unconscious* activity, that is to say it operates without the subject's being aware of it.

As I have just said, matters are not so simple in practice, and what actually happens is that the activity of the repressed complex is manifested not directly but indirectly in some distorted form that is often hard to recognize. In the above example, for instance, the subject might have counterbalanced his real attitude towards his friend by developing an exaggerated solicitude for his welfare, and have shewn great concern and dread whenever the friend ran the slightest risk of accident or

danger. Again, an abnormally strong emotion might be evoked by anything accidentally associated with the persons in question, a condition that Professor Morton Prince described some ten years ago under the name of "association neurosis." This distortion in the manifestation of the activity of the mental complex is often exceedingly involved, and one of the main difficulties in the psycho-analytic method is the unravelling of the confused end-product, which clinically we call a symptom. The psychological mechanisms by means of which the distortion is brought about are very intricate, so that in the time allotted it would be impossible for me to describe them. They have been worked out with great accuracy and detail by Freud and Jung, and an exact study of them is essential to the use of the psycho-analytic method.

Investigation on the lines presently to be indicated discloses the fact that every psycho-neurotic symptom is to be regarded as the symbolic expression of a submerged mental complex of the nature of a wish. The wish itself on account of its inacceptable nature is concealed, and the symptom arises as a compromise between it and the repressing force exerted by the main personality. The stream of feeling that characterizes the wish is dammed up, it can find no direct outlet and so flows into some abnormal direction. The metaphor of "side-tracking" is, I believe, used in American psychiatric circles to indicate this process. In more technical phraseology we may say that the effect of the original complex is inhibited, and so becomes transposed on to an indifferent mental process. This indifferent mental process has now become invested with the strength of feeling that properly belongs to the original complex, and so may be said to replace the complex. Thus arises what Professor Adolf Meyer calls a substitution neurosis, in which an abnormal outlet has been found for a pent-up affective process. The outlet may be in a purely mental direction, in which case we have such a symptom as a phobia, or towards various bodily processes, a condition that Freud calls conversion-hysteria, in which case we have such symptoms as a tremor or a paralysis. In the symptom the patient obtains a certain unconscious gratification of the repressed wish, and this means of obtaining the gratification, however perverse and abnormal it may be, is still the only means possible to the patient under the circumstances. This fact explains the obstinacy with which such a patient may instinctively cling to his symptoms, and is one of the causes of the resistance that the physician encounters when trying to remove these. I need hardly remind you that this obstinacy is often erroneously interpreted even by physicians as indicating mere wilful perversity, a mistake that does not conduce to success in treatment. Not

only does the observer commonly fail to understand the significance of the symptom, but the patient himself has no knowledge of its meaning or origin. In fact, *enabling the patient to discover and appreciate the significance of the mental process that manifests itself as a symptom is the central aim of the psycho-analytic method.*

In carrying out this method several procedures may be adopted according to circumstances. The hypnotic state, for instance, may be utilised in the search for forgotten memories. Only a very few of those acquainted with the psycho-analytic method employ this procedure at all extensively, for it has grave disadvantages which I need not here discuss. Personally I employ it only as a rare exception and for special reasons; under certain circumstances, however, it undoubtedly has a legitimate place. The procedure introduced and developed by Freud is the one most generally used, and gives by far the most satisfactory results. It is one of the ways of obtaining what is known in psychology as "free association," and is carried out by getting the patient to concentrate his mind on a given idea, generally one in relation to a symptom, and asking him to relate in the order of their appearance the various thoughts that come to his mind. It is essential for him to do this quite honestly, and fortunately we have several objective tests of his behaviour in this respect. He must suspend his natural tendency to criticize and direct the thoughts flowing in, and must therefore play a purely passive part during this stage. At first he will omit to mention a number of thoughts on the ground that they are apparently irrelevant, unimportant or nonsensical, and others because they are of a painful or unpleasant nature. After a time, however, the length of which largely depends on his intelligence and sincerity, he acquires the capacity of adopting the non-critical and passive attitude essential to success.

Other means of reaching buried mental complexes may briefly be mentioned. A study of various mannerisms, symptomatic movements and tricks of behaviour, and slips of the tongue or pen often reveals the automatic functioning of some repressed train of thought. The word-reaction association method as developed by Jung is of the highest assistance, particularly in furnishing us with a series of clues to serve as starting-points for future analyses. In this method a series of test-words are called out to the patient, who has to respond with the first word or thought thus called to his mind. From a general review of the kind of responses given much can be learnt about the mentality of the patient and the type of psychosis present. Further, by noting certain peculiarities in the individual reactions we may discover certain complexes or trains of thought that possess for the patient a high emotional value,

and these can then be followed and studied more fully. The peculiarities I refer to are ten or twelve in number. The chief are: undue delay in the time of reaction, failure to respond at all, response by repetition of the test-word, perseveration affecting the succeeding reactions, anomalous clang associations, assimilation of the test-word in an unusual sense, and erroneous reproduction of the reaction when the memory for it is subsequently tested. Last but not least is the analysis of the patient's dreams by means of the special technique introduced by Freud. The study of dreams is in this connection of supreme importance, for of all the means at our disposal it is the one that best enables us to penetrate into and understand the most hidden parts of the mind. No one can have more than an outsider's notion of the psycho-analytic method who has not thoroughly studied Freud's *Traumdeutung,* for in this work he has laid down the technique of his methods, and discussed the principles on which they are based, with a fulness to be found nowhere else in his writings.

By means of the methods just outlined we are enabled to determine the origin of the symptom by retracing the steps along which its pathogenesis proceeded. It is impossible to deal with the underlying complexes, to discharge their pent-up effect, to render them more assimilable by the patient, unless one succeeds in this task and brings them to the full light of day. The symptoms constitute a veiled language in which hidden thoughts and desires find the only means allowed them of coming to expression. We have to get the patient to translate his symptoms into more direct language, and thus to understand and appreciate the origin of them. In so doing we give the patient a deeper insight into the workings of his mind so that he is enabled to correct abnormal deviations, to overcome internal inhibitions and impediments, and to acquire a more objective standpoint towards the repressed mental complexes the automatic functioning of which has produced the morbid manifestations. He is in this way able to free his personality from the constraining force of these complexes, and, by taking up an independent attitude towards them, to gain a degree of self-control over his aberrant thoughts and wishes that was previously impossible. The method is thus in almost every respect the reverse of treatment by suggestion, although several would-be critics have naively exposed their ignorance of the subject in maintaining that the successful results are produced by suggestion. In suggestion treatment the physician adds something to the patient's mind, confidence, belief, etc., and thus makes the patient more dependent on him. The psycho-analytic method does not add; it takes away something, namely inhibition. It enables the patient to

disentangle confused mental processes, and, by giving him control over the disharmonies of his mind, leads him to develop a greater measure of self-reliance and independence. The training received by the patient is thus an educative one in the highest sense of the word, for he not only achieves a richer development of will-power and self-mastery, but acquires an understanding of his own mind which is of incalculable value for future prophylaxis. He grows both in capacity to know and in ability to do.

The conditions that lend themselves to psycho-analytic treatment comprise practically all forms of psycho-neurosis, the different types of hysteria, the phobias, obsessions, anxiety neuroses, and even certain kinds of sexual perversions. I shall refrain from relating any individual cases, for to do so would be only to weary you with the recital of a list of typical and atypical instances of these various conditions. It is further impossible for me to narrate any single instance of an analysis, for in every case the richness of material is so great that it would take several hours to give even an outline of the main points in the case.

The results obtained by the treatment, though by no means ideal, are yet very gratifying. They surpass those obtained by simpler methods in two chief respects, namely in permanence and in the prophylactic value they have for the future. Although most symptoms can be removed by other methods, such as hypnotism, yet anyone who has devoted much time to the study of these cases knows how great is the tendency to relapse, to recurrence, and to the appearance of fresh groups of symptoms. Mild cases can indeed be not only alleviated but even cured by the simpler psycho-therapeutic measures, so that these all have their sphere of usefulness; severe cases, on the other hand, need a more radical treatment, an uprooting of the actual morbid agents. It is easy to understand how this must be so. Hypnotic and other suggestion acts merely by blocking the outward manifestation of the underlying pathogenetic idea. The idea itself persists, because it has not been reached and dealt with, and sooner or later it will again manifest itself either in the same direction or in some fresh one. The analogy of a tubercular, or better still of an actinomycotic abscess, occurs to me in this connection. If the suppurating sinus is forcibly plugged then the symptom of discharging pus is removed, but sooner or later the pent-up pus will find a vent in either the same or a fresh direction. Before satisfactory healing can take place the tension must be relieved by instituting free drainage for each pus pocket, and the more thoroughly the focus of the disease is dealt with the better will be the result.

A few words are now necessary on the clinical applicabilities and limit-

ations of the method. It is a method that makes great demands on both physician and patient. Apart from technical knowledge the physician must evidently possess, not only unimpeachable integrity, but also a considerable measure of tact, patience and sympathetic understanding; without these qualifications he is unlikely to gain the patient's confidence to the requisite degree. The treatment further makes a great call on his time. Freud often finds it necessary to devote to a patient an hour a day for three years, but he acknowledges that the cases sent to him are generally of a very severe nature. In milder cases one can achieve very satisfactory results in a few months, a fact to which I can fully attest from my own experience. The amount of time may appear excessive unless one remembers the hugeness of the task imposed, for in all cases the roots of the trouble go back to early childhood, and important modes of reactions have to be altered which have been fixed and stereotyped for many years. When we consider how much trouble and time frequently has to be expended in the orthopedic straightening of a deformed limb, we should not grudge the same to the far more intricate task of the orthopsychic training of a deformed mind, especially when this results in converting an intolerable existence into a happy life, and a person paralyzed by doubts, fears and suffering into an active and useful citizen.

The demands made on the patient are no less great. The results of the treatment will vary with the intelligence, courage, honesty and perseverance he shews. With stupid and quite uneducated patients relatively little can be done, so that happily we can most help those whose value to the world is greatest. Again, age sets a formidable barrier to our efforts. In old age, when the plasticity of the mind is diminished, far less can be done than at an earlier period, and furthermore the time necessary to trace back the erroneous mental reactions through so many years is naturally longer. Still I have had a few fairly satisfactory results even above the age of fifty.

It will be realized that the method is at present not one generally applicable by the practising physician. Not only is the time necessary for the treatment a great hindrance, but also a laborious special training is necessary before the technique of psycho-analysis can be acquired to an adequate extent. It is generally admitted that this demands three years' incessant practice, a good previous knowledge of neurology being assumed. Here, as elsewhere, therefore, good work exacts arduous labour, and there is no royal road to the art of handling the most intricate and delicate machine we know of, the human mind.

You may now legitimately ask why I have taken up so much of your

time by describing a mode of treatment which I acknowledge not many will have the opportunity to learn or to apply. My answer is a two-fold one. In the first place I am not one of those who hold that the general physician should be cut off from all advancing knowledge except that which he can immediately apply in his daily work. No physician can apply all methods of diagnosis and treatment, but it is surely well that he should at least be aware of the existence of them. I cannot believe that because a country practitioner is not expected to apply the Wassermann test in the diagnosis of syphilis, or to perform excision of the Gasserian ganglion for the relief of trigeminal neuralgia, it is therefore better for him not to know about such methods. In the second place I wish to contribute to the general effect that this symposium must have in bringing home to you in some degree the present unsatisfactory state of medical education so far as psychology is concerned, for this is the main cause of the helplessness of the medical profession against the very maladies that are the triumph of the quack, religious or otherwise. The sooner we honestly face the shameful but undeniable fact that unqualified empirics can relieve distressing affections in cases that have defied medical skill, can produce results where we fail, the sooner will this flagrant lack in our system of education be remedied, and the better will it be for the dignity and honour of the medical profession. While the present state of affairs lasts, in which most physicians are given not five minutes' training in psychology in the five years of their student life, and in which there is no teacher of clinical psychology in any University or Medical School in the country, our profession must submit to being the prey of the charlatan and the mock of the scoffer.

THE DIVIDED RESPONSIBILITY IN REGARD TO PUBLIC HEALTH.

BY

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For the enforcement of all public health measures the personal or individual responsibility must ever rank as the most important factor. Municipal councils may pass by-laws and legislatures enact laws, it is just here at this point both bodies rise to their responsibility but fail to enforce the same, or as is too often the case but imperfectly enforce them, as is often necessary—this is done by the officials in a perfunctory manner whereby there is set up a false security, and good intentions are thwarted.

Read before the Saskatchewan Medical Society, at Saskatoon, July 8, 1909.

It must ever rest with the certain number of right thinking citizens of a community to act as watch-dogs in keeping any particular municipal health authorities up to the highest standard of efficiency so far as regards municipalized Public Health, for as Huxley correctly states:—"The higher and more complex the organization of the social body the more closely is the life of each member bound with that of the whole," and failure in action results seriously to a community.

Unfortunately in the past it has been the custom for most men and women to think they should do nothing but that which it pleases them to do without the least reference to the welfare of the home and particularly as to the welfare of the community in which they live. In fact if we look around the world from the sanitarian's standpoint—every prospect pleases and only man is vile. It is time the people realized to the full all the meaning of the words of Milton: "Accuse not nature, she hath done her part. Do thou thine."

These are times for action, and it is in the personal responsibility of the individual wherein lies the success or failure in attaining all that public health means to a people. It begins with the parents in the prenatal period of their offspring and continues with increasing import until their offspring in turn leave the home to assume similar responsibilities.

Canon Kingsley very truly stated some fifty years ago, it is our duty to see that every child that is born shall be developed to the highest possible pitch of development in physical strength, in intellect and virtue. And if this most desirable end is to be reached one of the chief factors must be by the adoption and enforcement of all the known rules of hygiene in the home, within municipal limits, and in conformity with uniform state enactments wisely and properly directed and assisted.

Unfortunately for the nation there is a widespread ignorance on the part of parents of the principles the knowledge of which is essential in properly caring for infants: this alarming and widespread ignorance is most disastrous from a national standpoint, and the fact that their helplessness has not gained for them the interest they deserve in the home, we must claim it as their rights as citizens and by municipal and state enactment provide for that most valuable of all national assets, that by which it lives and is perpetuated, viz.; the lives of its children.

In respect to many of the small tombstones and of the unmarked graves how correctly could be written the epitaph, "victims of parental ignorance in respect to Public Health." It is no exaggeration to say that 75 per cent. of the deaths of all first-born infants are preventable, their deaths being largely due to parental ignorance, I include both father and mother, in respect to the rearing of their offspring.

It must be remembered that ignorance of the temporal law is no excuse; how much greater then is the personal responsibility where the health of the nation's greatest wealth is concerned?

I may be pardoned for a brief reference to what is perhaps of still greater moment than the care of children, one which has been felt by at least one of the great European nations, and one which certainly would have been considered by one nation of this continent had it not been less prominent owing to the great tide of immigration which has increased by leaps and bounds its population. I refer to that very important question popularly known as race suicide—that damnably pernicious and criminal practice now so common in all classes of the community, but particularly in vogue amongst the wealthy and those of the middle walks of life—the prevention of conception—the guilty parties are to be found in both sexes and the guilt may be placed at the door of both fathers and mothers, for if the former are the chief offenders or criminals as regards prevention, certainly the latter are the criminals in respect to the inducing of miscarriage and thereby bringing on the physiological process of menstruation at a much earlier period than would be normally the case after conception has once taken place.

This is a subject in which some few of the members of the medical profession have at least in some portions of the country been too much identified with, and if for nothing higher and better, certainly for the credit and ennobling of the medical profession, the sooner such men are prevented from continuing such pernicious practices under the cloak of a medical license the better.

Certainly but little progress will be made against the insidious inroads made by these pernicious customs into the social life of our people until the men and women of our country are educated as to their great evil, and of the dangers which follow their practice.

Returning again to the question of the children—a child may be taught in school a few of the cardinal rules of hygiene, but if he returns to a home where every rule of health is ignored, what profiteth the child? Similarly he may be given the best physical instruction, but much of the good is undone if the home be dark and sunless and God's fresh air is regularly excluded during the eight or ten hours he spends in sleep, all on account of the ignorance of fond parents.

It is not the purport of this paper to indicate how the knowledge appertaining to public health shall be disseminated to the people; enough has been said to indicate the lines of individual responsibility. Parents must know the laws of health before sanitarians can hope for them to exemplify the same in their lives—many know of them in the abstract,

but to be of any worth they must know them of a truth and they must teach them to their children. Parents must realize the importance of the body as well as of the soul and mind. They must know that it is their duty to study the rules of hygiene, as they apply to growth and development of the body and the adoption of all preventive measures which will protect the child as it passes through life. They must realize the importance of the sound body as well as of an educated mind, for in life's struggle the latter will little avail if the offspring is a physical incompetent.

And looking higher still and considering the body as the earthly temple, surely it is essential, it is fitting and proper that the individual should know how to preserve it in health, strength and purity, for certainly as regards our bodies each one should realize his responsibility.

Of personal responsibilities perhaps that of the physician is the most onerous. Certainly the great advances made in medical science along the lines of serum-therapy, the application of toxines and similar therapeutic agents, as also the general and particular application of preventive medicine all enhance their responsibilities, and the medical practitioner who does not teach and practice to the full public health is simply a charlatan.

It will not suffice as at present for medical colleges and licensing boards to relegate hygiene or public health, or whatever term they choose to apply to this important branch of medicine, to a third rate or even second rate position. To know how to prevent illness is more important than to know how to stop a cough. This latter is the prerogative of the patent medicine man and requires no skill, but to prevent illness requires that the medical practitioner shall have more than the mere knowledge of how to vaccinate, how to properly isolate a case and subsequently disinfect. It calls for a knowledge of accurate bacteriological, physiological, chemical and the public health laboratory knowledge as well as the practical application of all that is represented in these groups of medical instruction in so far as they relate to the maintenance of the human body in normal, physiological health under all its varying conditions—the study of human environment—all of which knowledge must be given in medical colleges everywhere—and the day is not far distant when "preventive medicine" must rank as the most important subject in the medical curriculum, and curative medicine, and diagnostics and surgical skill, and dexterity be merely what they should be, the useful and proper allies of the Goddess Hygiene, and placed in that Limbo from which Public Health is only now coming forth in its might and power to work great and as yet untold blessings for mankind.

Dealing with Public Health from the municipal standpoint the fact must be recognized that personal liberty has its limits and the relation of man to man requires the formation of rules of action which have for their object the preventing of one man taking from another those rights, economic and individual, which are essential to present day happiness. So also are health rights to be obtained through common action and thereby the better is the guarantee that we shall work together not to injure either our own health or that of our neighbor, and that our neighbor shall not injure our health.

Many are the municipal health laws, codes or ordinances—they are all similar, having been copied from one another. The powers they confer upon municipalities are often very great. Some of the laws are bad by reason of their not conferring upon local authorities the power to enforce the same, others are good. Laws define right—men enforce them, and law making is one thing, law enforcement another, and doubtless thousands of lives are being lost every year, millions of dollars being spent on curing disease and caring for those incapacitated from labor thereby, and millions of days are taken from industrial pursuits, and in the end the working life of nations is materially shortened because health laws are not enforced both by the individual as well as the municipality.

One illustration will suffice. What law will ever stop the present waste of infantile life due to the character of the milk supplied in all large cities, unless dairies are systematically inspected and cleanliness enforced, unless milk is kept at a low temperature (50°) from immediately after milking—in the creamery, on the train, at the receiving station, in the milk waggon and milk shop? Not until dealers scald and cleanse their cans, unless licenses are taken from farmers, creameries and retailers who violate the law, and not unless mothers are taught to scald and thoroughly cleanse bottles, nipples, cups and dishes from which milk is fed to infants, will this be remedied. Here is an illustration of the interdependence of individual and municipal responsibility. We may discuss the subjects of certified milk, pasteurized milk, clean milk, or indeed any other kind of milk, but until the proper authority is vested with full power to control the supply from dairy to consumer along some other channel than through the many by which milk now reaches the consumer, we may inspect and inspect milk until we are dead, for at the best the method is imperfect, and inspection cannot be made perfect.

We cannot guarantee the present imperfect milk of our cities and towns under the most rigid inspection; how then will those who wish to load up the system by pasteurization guarantee that each and every vendor deals out a correctly pasteurized milk?

They want a precise and exact laboratory method to be conducted daily by every dealer under the highest sanitary requirements, and the municipality to guarantee that each dealer sells pasteurized milk that is pasteurized milk.

Can this be done under present methods? Here is a point where we cannot take the word of the individual or accept the guarantee of the municipality, owing to the difficulties of inspection and supervision.

Is it not therefore a point where the municipality should for the benefit of the community as a whole, simply step into the breach and establish a milk depot, or depots as the size of the municipality may require, to which the milk shall be delivered by all licensed and inspected dairymen, paid by the municipality for the same on a basis of quantity and quality? Let the municipality deliver the milk pasteurized or otherwise as the health authorities decide, in regular routes with no overlapping in delivery, and let all be upon a cash basis as between the municipality, the furnisher and the consumer, at the minimum cost of inspection and where the maximum of purity will be assured.

In this country the legislature of each province is given full control over municipal institutions, it having been evidently thought better to teach each locality to manage its own affairs in keeping with the old proverb—if you wish anything well done do it yourself.

In brief the situation is this in most civilized countries: when you are born your name must be registered with the proper city or municipal official: when you are of school age the municipal authority provides you with a school and teacher, and requires your attendance, some times you are provided with school books free of charge. When you go out upon the streets you find them paved, lighted and cleaned by the council and you cannot under penalties remove or alter the pavement or pollute the street. Your life and property are protected by police and firemen provided by the council, it demands a tax should you engage in certain classes of business, and should you be fortunate enough to build a house you must submit your plans and secure a permit.

As to conveniences the council, sometimes assisted by Carnegie, provides you with a free library, it provides officials to inspect the quality of your food and drink, it removes your garbage from your yard and your sewage from your house and provides you with water, with parks and squares, and a hundred other things, and if poverty overtakes you it will aid the charitable in giving you a home, and when the end comes it will, if your friends do not claim your body, bury it and before doing so register the facts of your death. Thus from birth to death the municipal council affects our lives. The individual rights of

the citizen are vested in the council and to it for all these privileges we pay taxes, and thereby the rich unconsciously provide many things which have important bearing on the public health which those in more humble walks of life could not otherwise afford. Thus in benefitting themselves they unconsciously add very materially to the improvement of the health of the masses.

It will thus be seen that in this evolution of municipal government as apart from state or federal laws the responsibility of the enforcement of a large amount of public health measures has been placed upon municipal authorities, and in the past the central authorities have been satisfied with the enactment from time to time of more advanced public health laws, but the enforcement thereof has usually been placed upon local health authorities, and the central authorities have thus been relieved of any responsibility though willing at all times to tender advice usually through the Central Board of Health. With such a system generally prevailing it cannot be said the results have on the whole been satisfactory.

In regard to such an important group of questions embraced under the head of public health, it is essential they must be uniform for the larger community of people as comprised in a state, dominion or country in order that they may be efficient, but in so far as the higher power enacts these laws for various municipalities whose councils change from year to year as the municipal elections recur, so the administration of the laws are subject to more or less change. And further, as the inhabitants of a state, dominion or country are really residents of different municipalities for longer or shorter periods of time incident to the many modern means of transit, it is essential for good government, for the affording of the highest protection to all, that while details as to the adoption of any particular set of health measures must remain with the municipal authorities, yet the supervision and the power to enforce, if necessary, should be vested in and the power judiciously exercised by the government which enacts them, but the expenses of their enforcement should be a cost chargeable to and collectible from the municipality which fails in their enforcement, otherwise it will be found that municipal authorities will readily yield up their duties to the larger and more powerful central body.

In public health matters the municipality would naturally be expected to work out its own salvation. The common health interests of the individuals living in the municipality, both men and women, and particularly the children, being of such moment as to require the rigid enforcement of the most modern health requirements.

But it is too often the case that local health by-laws or codes of health, although upon the face of them bearing the impress of all that is good for the community, yet in the method of enforcement or the manner of inspection are in the end really a farce, and the strong arm of the government which created their local powers must for the general good retain the power of enforcement.

In conclusion a short reference is desirable to the responsibility of the national government in respect to all that appertains to the health of the people. It will not suffice for any federal government to say that the question of public health is relegated to this or that particular state, provincial or territorial legislature, that the health of any particular city or country or geographical district is a local matter and does not concern the people of any other portion of the country, and if the local authorities will not engage in the solution of their own particular district the national government should not. This is a false premise, for many public health questions are national in their import. Indeed we may go further, many health questions are international and can therefore only be dealt with by nations: for instance, the sewage pollution of the waters of the great lakes of this continent regarding which we in Ontario are deeply interested. The preservation of these waters from pollution by sewage is of interest and import to all who live along their shores as well as the hundreds of thousands who yearly visit them from all portions of the civilized world. The many points involved in the question cannot be dealt with by the province, but must be considered by the nation. It is to the national government we look for a protection as regards the health of those who seek homes in our midst; that responsibility has in part been acknowledged, but cannot we go further, what of the valuable lives born each year to the fathers and mothers of this country? Are they not a more valuable asset than all the immigrant population? Truly the wealth of the nation is in its babies, and being national the government which represents that wealth should do more in their behalf. Here in Canada the national government has in its wisdom set an example by taking over the health of our cattle which is a part of our national wealth, but what of the peoples' health? Have they no interest therein? Time fails me to indicate all their responsibilities. Surely the physical conditions are at least of national import and should have a properly constituted National Health Department working in cooperation with provincial, state or territorial departments aided by municipal local health authorities and carefully guarded and directed by public opinion.

In conclusion, Public Health is pre-eminently a national question although requiring the assistance of state, provincial and municipal ma-

chinery and laws for the proper and efficient working out of methods and the enforcement of laws for the betterment of communities, and it may be necessary for good and efficient government that well-defined lines shall be laid down upon which each of the several governing or legislative bodies in a country shall have power to legislate upon and the limitation of enactment be clearly defined, but for the better enforcement of health laws there must be some central authority clothed with proper power to act when either individual, municipality or province fail to enforce laws adopted for the protection of the health of either an individual, community or district.

It is essential for the carrying out of all laws which in any way relate to the public health that such power be retained and exercised by the national government,—it is essential for the protection of the health of each individual.

Consequent upon financial losses in respect to national wealth as regards agriculture, horticulture, stock raising and the great manufacturing industries, and other branches of national wealth, legislatures and parliament devote annually large sums of the public monies for the improvement of all these branches of the wealth of the nation; colleges have been erected at public expense, and large sums appropriated for their maintenance, chiefly devoted to the branches of agriculture; universities have set apart departments to foster agriculture and forestry, and every nation has departments of government under Cabinet Ministers for the fostering and improvement of the branches of national wealth, but how many have a Minister of Public Health? but few, or how many have the various branches relating to the health in one large sub-department? But the all of public health is not in the statutory powers of the government. There are many and great problems of public health that have yet to be worked out, and in the solving of these problems much research work, much experimental work has to be instituted and carried on, many social sanitary problems have to be studied, all of which require the expenditure of money and the engagement of a staff of the best experts the nation can engage. Certainly the physical training and developments of both boys and girls must be worked out upon national lines. In my opinion as regards the boys the best results and at a minimum cost can, and should be at once secured, by some form of modified military drill. It will be necessary that many of the vaccines, serums and antitoxines used in preventive medicines should be prepared by the state at the expense of the people and distributed to local authorities at cost, as the almost prohibitive prices of commerce prevent their general use.

The state must provide well equipped laboratories. It will not do for any country to rely upon the benevolence or generosity of philanthropists for the studying of the many questions relating to preventive medicine, these must be carried out by the national government as they have for their highest object the health of the people which means its highest wealth.

Surely this is a fit, a proper sphere for the nations of the earth to work in—none higher, none better and none of more moment or greater import. The greater the nation and the more dense the population the greater the present responsibility, while for a young nation, one looking forward to vast increases in population in the coming years, the importance of public health questions is of vital importance as it is entering the threshold of national life, and to a nation such as we Canadians have the honor to form a part there is every necessity for the creation of an Imperial Health Bureau with its unit in every branch of the Empire, each working in harmony with the Central Bureau, and each doing its part of experiment and research and laboratory work which may be most fittingly and appropriately worked out by each particular branch, all co-operating and assisting to solve the intricate questions all of which have for their object the health of mankind and the prevention of sickness and suffering.

ULCERATIVE STOMATITIS ASSOCIATED WITH VINCENT'S BACILLUS.*

BY

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The following cases are quoted to illustrate the association of a mildly contagious form of ulcerative stomatitis with the presence of Vincent's bacillus, *i.e.*, with the symbiosis of bacillus fusiformis and spirochæte dentium. These two organisms are almost invariably found together, usually in masses so that a smear taken directly from the lesion looks like a pure culture. The spirochæte is generally believed to be derived from the fusiform bacillus and to be a stage in its life history, though this has never been definitely proved. In recent text-books we find two conflicting views with regard to this organism or pair of organisms. First, that it is a saprophyte, non-pathogenic, which occurs in the mouth and multiplies enormously in the necrotic tissue of any foul ulcer, without causing any harm to the host. The advocates of this view point out that it is frequently found in the normal mouth, has been recorded in dental caries,

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scurvy, mercurial stomatitis, syphilitic ulcers, diphtheria, noma, and other lesions, and also that it has not been proved to be pathogenic to animals. The second and more generally accepted view is that, while found in the normal mouth like many other pathogenic organisms, it is capable under certain conditions of becoming virulent; that it is particularly apt to cause secondary infection of any ulcer of the mouth and so to be found as a mixed infection in syphilitic or diphtheritic lesions; and lastly that it causes two characteristic lesions by itself, viz., the appearance of a false membrane and superficial ulceration on one or both tonsils, with mild constitutional disturbance, the so-called Vincent's angina, and secondly, an ulcerative stomatitis or superficial ulceration at the margin of the gums, often extending to the cheek or tongue, and quite frequently associated with membrane on the pharynx, in other words the same lesions as Vincent's angina with a different distribution.

It is claimed that these diseases, Vincent's angina and ulcerative stomatitis, are distinct clinical entities, that they are mildly infectious, especially in institutions, that the characteristic organisms are found in the lesions in almost pure culture, that in the newest lesions and deepest parts the smears give the most typical appearance, and that sections show the bacillus fusiformis in masses in the portions of the ulcer immediately adjoining the normal tissues.

The first epidemic, if it may be so called, to which I wish to call attention, occurred some months ago in the Children's Memorial Hospital. The first case was a little girl, B. R., 6 years of age, with extensive bone and glandular tuberculosis; her general nutrition was poor and she had several carious teeth. The disease began with a superficial ulceration along the margin of the gum next a carious tooth, this rapidly extended, so that in three or four days the gums opposite four adjacent teeth on the upper jaw were affected, a false membrane appeared on the inside of the cheek opposite the lesion, and also a small patch on the edge of the tongue. She suffered from some fever and complete anorexia, the neighbouring submaxillary glands were acutely inflamed, the cheek swollen, her breath was very foul and tongue heavily coated. From the poor condition of the child, the prostration and the foul odour, noma was anticipated, but the ulceration was very superficial, in fact practically a necrosis of the mucous membrane. Culture showed only various cocci and smears revealed large masses of bacillus fusiformis with numerous spirochætes. Under the use of cleansing solutions and liquid diet, the whole trouble cleared up in ten days, leaving no scarring. Ten days to two weeks after the beginning of this case, two other children who had been associated with the last patient, became sick simultaneously in the same way.

These children were 3 and 7 years old respectively and suffered, the younger from rickets, and the other from a tuberculous hip, and were both in a poor state of nutrition. The stomatitis began as before at the margin of the gum on one side and gradually extended in the form of a superficial ulcer, with slight constitutional disturbance and a peculiarly fetid odour to the breath. Smears as before showed the characteristic Vincent's bacilli. These two cases were milder and cleared up in about a week under local treatment. No further cases occurred in the institution.

The second outbreak happened recently in an orphan asylum in Montreal. The first case was a little girl 5 years old, poorly nourished and anæmic, recently admitted to the institution. She was said to have had a sore mouth for two weeks. Her gums were somewhat swollen and bled easily; there were shallow superficial ulcers along the margin of the gums of the upper incisors and left premolars, also a small ulcer opposite the left lower canine; her breath was very foul, temperature 100°, submaxillary glands enlarged and tender, especially on the left side. Milk diet and hydrogen peroxide mouthwash were prescribed. Three days later she appeared much worse; a shallow ulcer about the size of a 10-cent piece was present on the inside of the left cheek, and a patch of adherent false membrane on the left anterior pillar of the fauces; she seemed to suffer considerable pain and there was marked salivation. Cultures on blood serum gave only cocci, smears revealed the characteristic bacilli and spirochætes in large numbers. I now prescribed the treatment recommended by Holt in the last edition of his text-book, viz., fairly large doses of potassium chlorate, frequently repeated, and in 48 hours to my surprise the mouth had returned to a practically normal condition. In this case the potassium chlorate certainly seemed to act as a specific.

Two weeks later I was asked to see this patient's brother, aged 8 years, also poorly nourished and anæmic. He had a similar condition of the gums, only less marked, temperature 99½°, foul breath, and enlarged glands under the jaw. Smears as before showed the typical bacilli. Under the administration of potassium chlorate and an antiseptic mouthwash he rapidly recovered. I should have mentioned before that none of these cases had received mercury in any form.

These cases then all showed the marked characteristics of the disease generally known as ulcerative stomatitis. They occurred in institutions, in children from 3 to 8 years of age, all of whom suffered from malnutrition or ill-health and there seemed to be a mild infectiousness about the disorder. The disease began as a small superficial ulcer at the margin of the gums and afterwards extended in some cases in the form of an ad-

herent false membrane or superficial necrosis to the mucous membrane of the cheek, the tongue, or the fauces; there was a characteristic fetid odour, mild constitutional disturbance, and enlargement of the neighbouring lymph glands. Smears from the lesions showed the characteristic organisms in great numbers. All recovered in one to three weeks. Potassium chlorate given internally seemed to hasten the recovery.

As these cases seem of somewhat infrequent occurrence here and the association of the disease with Vincent's bacilli does not appear to be generally recognized, I thought it might be of interest to bring them to the notice of this Society.

DIPHTHERIA OF INTESTINES.

BY

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I wish to record an unusual case of dysentery which came under my notice recently. The patient was a female child, six years old, who was born in Fiji. The parents were on their way home to Germany, taking the child with them. Shortly before leaving Suva, the child was taken ill with what seemed a mild dysentery, and the condition persisted throughout the trip of two and a half weeks. On arrival at Vancouver, the child was found emaciated, and very much exhausted. The dysentery was fairly well held in check by the treatment the patient received on ship board, but she was having several small stools daily, stained with blood and consisting of mucus and pus. Some of the motions were of pure mucus—about half a pint at a time. To ascertain the type of dysentery, I called in Dr. McKee, bacteriologist, who excluded both the amoebic and the Shiga types. He found enormous quantities of streptococci. These rapidly disappeared under treatment with streptolytic serum, but the symptoms did not abate. Finally cultures showed bacilli of the diphtheritic type. At once anti-diphtheritic serum was used, with immediate improvement of the symptoms, and two days later a complete cylindrical cast of the bowel, about four inches in length, was passed. The child made a slow but uninterrupted recovery after this. The cast was examined microscopically, and proved to be a true diphtheritic membrane. It was noted that the patellar reflexes were absent. Later the patient developed paralysis of the anus, so that for a couple of weeks the bowels moved involuntarily and unconsciously. In this case we had a dysentery caused by diphtheritic infection of the bowel.

FURTHER INDICATIONS FOR THE CÆSAREAN SECTION.

BY

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The indications for this wonderful operation are slowly but surely broadening. Two thousand years ago it was only done on dead women to save a possibly living child. So that the death rate was a hundred per cent. for the mothers and about fifty per cent. for the child. A thousand years later some heroic operator proposed to perform it on women who were dying but not yet dead after an impossible labor of several days duration. A few, perhaps ten per cent., of these recovered to the surprise of the operator's contemporaries, who probably looked upon him as a mendacious fellow for claiming any maternal recoveries at all. During the second thousand years the death rate was so high for the mothers that no one dared to publish his statistics. In 1874 Cazeaux and Tarnier estimated the death rate at between fifty and seventy-five per cent. of the mothers. Even these few successes emboldened others to operate earlier and earlier, so that in 1892 Coe estimated that there had been sixty-eight cases in the United States, with a maternal mortality of less than forty per cent. In 1903 Greene reported nine cases with one death, or 11 per cent. The greatest drop in the death rate was due to the introduction of Sänger's method of sewing up the tear in the uterus; but even with that, the most improved technique, the death rate remained about ten per cent. until the family doctors began to call in consultation an expert abdominal surgeon whenever they had a known case of disproportionate pelvis.

As with ovariotomy and with hysterectomy for fibroid a lowering of the death rate induced surgeons to operate earlier, and this in turn led to a still smaller mortality. The present death rate of about two or three per cent. is chiefly due to making the operation one of election instead of one of emergency. Up to ten years ago even the most favorable cases for operation were women with deformed pelvis, who had been in furious labor for many hours and on whom repeated and forcible efforts had been made to effect delivery. The operation may have been as skilfully performed then as we can do it now, although perhaps not so quickly; so that we can safely say that the majority, if not all, of the deaths were due to the injuries received by the woman from the futile

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attempts of nature or art to deliver her. The next great decrease in the mortality occurred only two or three years ago, when a few of the most courageous Fellows of the American Gynæcological Society inaugurated a new era in the history of Cæsarean Section by not only improving the condition of the class of women who had formerly been operated on, but by adding two entirely new and more favorable classes. That is to say, that instead of waiting until the life of both mother and child have been jeopardized by the violent use of forceps and then doing Cæsarean Section, they have gradually persuaded the family physician to do less and less damage; until now it quite frequently happens that we have an uninjured woman to operate on. When every family doctor becomes skilful enough to recognize that a given head cannot pass through a given pelvis without serious injury to either mother or child or to both and advises Cæsarean Section before using forceps; or even when he ceases in his efforts with the forceps before he has done serious injury; or even if he could do a moderate amount of damage without infecting the mother; then in the hands of an expert Cæsarean Section would reach its highest perfection, namely, a hundred per cent. of recoveries, which indeed it has almost reached in this year of 1909.

But, besides this class of deformed or disproportionate pelvis, which still gives a very small percentage of deaths, two other classes of women have been added, who, because they are operated on before any injury whatever has been done to the soft parts, promise to give a death rate as low as an average delivery in a private house, about one-half of one per cent. for the mother and still better for the child. One of these classes comprises the women with puerperal convulsions coming on just before the onset of labor. Up to a few years ago the best we could do for them was an *accouchement forcé* which has a high death rate for both mother and child, even if the mother were in good condition. But the woman with puerperal eclampsia has been an anæmic woman for several months and has a low opsonic index, so that injury which a woman in good health but with a contracted pelvis might easily have recovered from, is fatal to her.

It is probable, however, that even in these cases there will be one hundred per cent. of recoveries as soon as the whole mass of family doctors have been educated up to the point of abandoning entirely the *accouchement forcé* and religiously refraining from doing any injury to the soft parts.

The other class, namely those with placenta prævia, is fortunately a very rare one, but which until a few years ago had a death rate as high as forty per cent. in Europe and ten in America, when treated by rapid

delivery; it now gives a mortality almost *nil* when delivery takes place by Cæsarean Section.

With all these improvements taking place we are justified in assuring a woman with a deformed pelvis or with albuminuria or placenta prævia that she and the child run less risk from delivery by Cæsarean Section than by any other natural or artificial process, and that if she should become pregnant again and if any of these three things should happen for the second time, which they are not very likely to do, she can be delivered again and again by Cæsarean Section with little if any greater risk than an ordinary confinement. So that if the patient and her doctor leave it to us to do as we think right, we will not sterilize her. But what shall be our attitude if the woman demands to be sterilized so as to be saved from the inconvenience or expense or the slight risk which some might claim for the operation? I am inclined to think that in that case we are justified in complying with her request, not by removing the ovaries, but by taking out an inch or so of the uterine end of the tube and sewing the peritoneum over the interstitial part.

My friend, Dr. Reddy, the director of the Woman's Maternity Hospital, informs me that he has entirely given up *accouchement forcé* in favor of Cæsarean Section, of which he has done about twenty, with only two deaths, and they were desperate when they came in. Dr. Barton Cook Hirst has done over seventy with a still smaller death rate, the deaths only occurring in infected cases. By our present method the child and placenta can be delivered in less than a minute from the first incision, while the hæmorrhage is much less than from an ordinary confinement. Before closing I would like to say a word of warning against the vaginal Cæsarean Section, which has all the dangers of the *accouchement forcé* without any of the advantages of abdominal Cæsarean Section. It must always have a high death rate.

A REPORT UPON CASES OF GAS-AIR ANÆSTHESIA IN MAJOR SURGERY.

BY

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Of recent advances in the domain of anæsthetics none, perhaps, is more interesting than the use of nitrous oxide gas, combined with air or with pure oxygen, in major operations. For very many years it had been taught that gas was suitable only for operations of minor importance and of short duration. On the one hand, it was said, the

anæsthesia obtained was fleeting, and on the other hand its prolonged exhibition was dangerous. And this opinion, I believe, still receives very general acceptance. Within the last few years, however, certain surgeons, chiefly in America (Bevan, Webster, Crile, Parker and others), have been reporting numerous cases of gas anæsthesia lasting as long as two hours, in major operations of many kinds. These interventions have not to all appearances been attended by danger; on the contrary the general opinion seems to be that the patient's condition is less affected than by a corresponding length of ether or chloroform anæsthesia. Crile, indeed, remarks (verbal communication) that he chooses the gas-oxygen combination for all his "critical cases."

It is not my intention this evening to go into the history of the subject, nor to discuss the details of the administration of gas in its various combinations. Rather is it my desire to do no more than call the attention of the Society to the matter, and in that idea, to report briefly the few cases of major surgery which up to the present constitute my own experience. It is to be remembered that the use of gas in the short operations of minor surgery and as a preliminary to ether is not here considered. That we have been accustomed to for many years.

The more interesting cases of the series, briefly recounted, are as follows:—

Nine cases of appendicitis, of which 5 were of the catarrhal type, 2 perforated with local abscess, and 2 with general peritonitis; one case of intestinal obstruction by a Meckel's diverticulum, in which the appendix was removed as well as the diverticulum; one of obstruction by volvulus with old adhesions; one case of traumatic rupture of the bowel with general peritonitis; one amputation at the knee-joint for senile gangrene; two cases of empyæma. The duration of the operation in these 15 cases varied from 12 to 35 minutes. Only twice have we had the opportunity of a longer gas administration than this. One of these was the division of the descending colon and the formation of an artificial anus, a procedure which, owing to difficulties peculiar to the case, occupied 53 minutes. The other was a nephrectomy with excision of the ureter down to near the bladder for tuberculous disease, occupying one hour and twenty minutes. It should be added that in this last case about one oz. of ether was used at an early stage to overcome a rigidity of the lumbar muscles, a rigidity which did not reappear with resumption of the gas.

It would be presumptuous to dogmatise upon the basis of such a small series as the present one. Yet, I can at least say that the experience of these 17 major cases, added to that gained by the more frequent

administrations for minor cases, is confirmatory of the results obtained by those who have used the method most extensively. The advantages and disadvantages are well known. It is objected that the anæsthesia obtainable is imperfect and short; that muscular relaxation is incomplete; that it needs especially skilful administration; that it is insufficient in anæsthetizing power for stout, plethoric and alcoholic patients; and that its cost is comparatively great. It is also urged that the cyanosis is disturbing to the operator; and that the prolonged use of gas is dangerous.

These objections, though well found in the main, need qualification. Thus, the anæsthesia is imperfect in the sense that the patient is kept always near the border-line of consciousness, and that the muscles are frequently only partially relaxed; yet in our experience the anæsthesia is good enough, in that the patient never feels pain, and that complete muscular relaxation is in most cases quite unnecessary.

The anæsthesia is short, certainly, if the patient receives no renewed supply of gas. But when he is given a judicious admixture of oxygen, either pure, or in atmospheric air, either simultaneously with the gas or in alternation with it, the anæsthesia, with a little practice, may be maintained, as reports testify, for two hours. I would like at this point to mention that I have had in the adoption of this form of anæsthesia, the advantage of the collaboration of Dr. Nagle, Anæsthetist to the Royal Victoria Hospital, whose experience and skill in administration have been of the greatest value. We have not as yet installed any special apparatus for the combined use of gas and oxygen. The method has been simply to anæsthetize with gas, as in the usual gas-ether combination, and then, as judgment dictated, to admit air at intervals in large amount by removing the mask, and also continuously by not allowing the mask to fit tightly.

It is true that the application of this method is, as compared with ether and chloroform, more or less restricted. The stout, plethoric, and alcoholic patients, difficult to get under with ether, are still more difficult to get under with gas. Yet I believe the limitation in this direction is not so great as is generally supposed. This comes to be a matter of judgment in each case; and an anæsthesia begun with gas may need to be completed with one of the other agents. There is no harm done thereby.

The skill necessary in administration is apparently soon acquired; and Dr. Nagle informs me that one learns, just as with ether, the trick of a smooth anæsthesia by dint of attention to details.

By our calculations, we find the cost of gas to be but little greater

than that of ether, except when pure oxygen is added. This, as a matter of fact, we have not, hitherto, found necessary. As compared with ether, one saves by the rapidity of the effect, by greater quickness in operating, and by the lack of waste.

As to the cyanosis, one must just learn to disregard it. It disappears at the close of the operation as quickly as it comes; and it leaves no material trace of its presence. It is much less during the operation, once anæsthesia is obtained, than at the beginning, while anæsthesia is being induced.

The danger alleged to accompany the prolonged use of gas would seem to be present—arguing purely from general principles and from experimental work, for we have as yet neither seen nor heard of fatal cases in man —only when oxygen is continuously excluded and the gas pushed to the point of absolute asphyxiation. Then, naturally, the respiratory centre gives out. The heart continues its function, however, and artificial respiration, under such circumstances, is of far greater saving power than when the primary failure is on the circulatory side. We have not as yet sufficient experience in the prolonged use of gas to assert that it is absolutely without danger, though we have long known that its use over a short period is practically without mortality. Yet this last fact, together with the exceedingly favorable reports of hundreds of cases now published of operations lasting from one to two hours, encourage us to believe that the gas-air combination is the safest general anæsthetic we now possess.

The advantages of gas in major work are striking. Personally, I count its safety as one of them, though that is an impression or a belief not yet, perhaps, sufficiently proven. In any case, the freedom from post-operative nausea and vomiting is incontestable, and the advantage thereof enormous. We are accustomed to accept with complaisance the suffering of the patients in this respect, a suffering which causes many of them to swear that "they would rather die than take ether again," and to console the particular sufferer with the remark that "ether is so safe." This is frequently an insufficient consolation to the patient. In our series, nothing has been to me personally more gratifying than to find the patient resting comfortably and in complete consciousness almost immediately after operation, not vomiting, not choking with mucus, not suffering, in short, except from the smart of his wound, often indeed, in virtue of a little morphia, not suffering at all. The pain caused in the wound by the vomiting of ether is excruciating; this is avoided with gas. A fourth year medical student, upon whom I had operated for the removal of an acutely inflamed appendix, woke up as the bandages were

being applied, and immediately demanded to see his appendix, discussed *con amore* the scientific aspects of his case, assured us that he felt very comfortable, and extolled, as one who knew, the virtues of gas as compared with ether. As to insufficient relaxation of muscles, that objection only partially holds. It is applied usually to abdominal operations. For myself I have not found either that the muscles were noticeably tense, nor that, when they were incompletely relaxed, that factor interfered at all with the operation. Retractors always overcame the condition easily, and the field was always ample.

We have not conducted any regular examination of the urine after gas, save for acetone. This substance was absent in practically all the cases: and in any case its appearance in the urine cannot, even with other general anæsthetics, be considered yet as due to the anæsthetic with certainty. Fasting for a day will cause its appearance. However, it is well known that gas has practically no deleterious effect on kidney excretion.

Another considerable advantage is that the patients come out of the anæsthetic in as good condition as when they entered it, apart from the effect of the operation in itself. This was particularly noticeable in two or three interventions, not recorded above, upon very weak patients, abdominal explorations for suspected abscess in the subphrenic space. These occupied only a few minutes, five to fifteen, it is true; but, as compared with similar operations under ether, it was evident that the gas taxed the patients' strength very much less; in fact the gas seemed to leave them absolutely no worse than it found them.

We are not yet certain as to the applicability of gas to cases of weak or irregular heart action. I have not used gas in such cases, and I should hesitate to use it.

We found that operations in the upper half of the abdomen, particularly if the mesentery were much pulled upon, were unsuited to gas. Anæsthesia must here be deep to overcome the severe respiratory reflex so easily excited in this region of the abdomen. The amputation for senile gangrene seemed to show the value of gas in such elderly and weak patients. It was completed in 25 minutes, and there was not the least shock. In short, as Crile has remarked, the method seems valuable for the "critical cases," apart from serious cardiac conditions. The weak, the septic, the anæmic stand gas well.

THE PIRATES OF MEDICINE.

BY

JOHN MCCRAE

When the great Sancho Panza became Governor of Barataria, his physician stood by his chair and with much outflow of words, ordered away dish after dish, as soon as, or before each was tasted. Sancho threw himself backward in his chair, and looking at the doctor from head to foot very seriously, asked him his name and where he had studied. To which he answered, "My lord governor, my name is Doctor Pedro Rezio de Aguero, I am a native of Tirteafuera, lying between Caraquel and Almoddobar del Campo, on the right hand, and I have taken my degree in the University of Ossuna." "Then, hark you," said Sancho in a rage, "Signor Doctor Pedro Rezio de Aguero, native of Tirteafuera, lying on the right hand as we go from Caraquel to Almoddobar del Campo, graduate in Ossuna, get out of my sight this instant—or, by the light of heaven, I will take a cudgel, and beginning with your carcass, will so belabour all the physic-mongers in the island, that not one of the tribe will be left: I mean of those like yourself, who are ignorant quacks, for those who are learned and wise I shall make much of and honour as so many angels. I say again, Signor Doctor Pedro Rezio, begone! or I shall take the chair I sit on, and comb your head with it to some tune, and if I am called to an account for it when I give up my office, I will prove that I have done a good service in ridding the world of a bad physician, who is a public executioner."

I have gathered a few notes of some of the Doctor Pedro Rezios—who flourish to-day as they did then; those for example who from wealthy factories turn out the remedies that are "household words." What bad language people do permit in their homes!

These loud-shouting remedies make extravagant claims as to their powers; some of them are indifferent honest, others not at all so, and they make interesting reading as found unveiled in the last "Extra Pharmacopœia." Here are some grouped all together, the good and the bad: Beecham's Pills contain aloes, ginger and soap; Carter's Little Liver Pills, podophyllin gr. 1-8, aloes gr. 1-3; Cuticura soap is hard and soft paraffin; Hood's Sarsaparilla contains 19 per cent. alcohol and less than 2 grs. pot. iodide per dose; Mrs. Terry's Drink Cure, 98 per cent. sugar and 2 per cent. salt; Munyon's Blood Cure and Munyon's Kidney Cure, 100 per cent. sugar; Zam-Buk contains eucalyptus oil and paraffin; and for these and their like, in the year ending March 31, 1906, the British public paid $11,500,000.

This trade has built itself upon the regard that the man has for the physician; and the most blatant quacks generally reason that the older the physician the more the regard; until one reads advertisements of old Dr. So-and-so's remedies, which almost turn one's stomach in the reading and entirely do so when one considers that there are people to trust them.

Since every physician is liable to sad mistakes, one may find the regular and the quack in the same boat as far as results obtain; but one difference that we have always insisted upon is that any knowledge we have must be given freely to the profession at large; yet this was not always so. Two of the famous physicians of Queen Anne's time, whom I shall mention, sold medicines of a secret composition, Sir Hans Sloane, who had an eye salve, and Dr. Mead, who used a powder for the bite of a mad dog. To judge such men, one has to put one's self into their times, for knowledge is a plant of slow growth, and sometimes the medical profession is too slow in recognizing and incorporating in its practice useful ideas. Massage is at times too useful to be left to an osteopath, and that irregular school, called The Bonesetters, occasionally had results which testified to something sound in their practice. Dr. Wharton Hood, a regular practitioner of note, published in the *Lancet* and afterwards in a book from the MacMillan Press, some of the means which he saw used by one Hutton, a noted bone-setter. Dr. Wharton Hood speaks at first hand, and after Hutton's death was freed from the necessity of silence. Sometimes, he says, "cases of diseased or injured joints have been compelled to unnecessary and injurious rest by qualified practitioners, and patients weary of irksome and unavailing treatment have resorted to quacks." Hood ventured into the regions of irregular practice, and brought back what was there worthy of use.

Sometimes the irregular practitioner freely or by compunction admits his method. An old woman, who was accustomed to treat many ills for the reward of a penny and a loaf of bread, was charged with witchcraft; in return for her liberty she betrayed her methods; all she did was to repeat to herself the following verse after receiving her bread and her piece of coin:—

"My loaf in my lap,
My penny in my purse,
Thou art never the better,
Nor I never the worse."

Sometimes the appearance of great wisdom does not carry much greater substance than this.

From the days of Chaucer's "Doctor of Physike," whose dress was lined with taffeta and with sendal, even until to-day we have hardly escaped from Chaucer's description:—

> "Of his diet measurable was he,
> For it was of no superfluitie,
> But of great nourishment and digestible,
> His study was but little on the Bible."

This somewhat unjust statement I fear still dogs us as does also the couplet which follows:—

> "For gold in phisike is a cordial
> Therefore he lovéd gold speciall."

But I doubt not that Chaucer's "Doctor of Physike" was a thorough 'regular;' in days not much later, he would have had to be or this is what he would suffer: "A counterfeit doctor was set on horseback, his face to the horse's tail, the same tail in his hand as a bridle, a collar of jordans about his neck, a whetstone on his breast, and so led thro' London and then banished."

A quack is defined by the Century Dictionary as a knavish practitioner of medicine, *i.e.*, one who practices medicine knavishly. One may use his art foolishly, and may be self-deceived as to the power he thinks he possesses, but this no more than brands him a fool; a well-intentioned fool is often, like a drunk man or a child, under the special protection of Providence.

For the irregular practitioners of healing, I have no brief to call them quacks; some of them are, but those who are honest in their way are not; but what a way! There is no doubt of the folly of those who employ them as medical advisers; it is as if they employed a dentist who used one forceps for all the different teeth, and a blacksmith's pincers at that; most of us who desire a legal opinion do not go to the plumber for it; nor do we fetch the clergyman to fix the kitchen sink; and we rarely gather figs of thistles. And a man is at full liberty to have what medical attendant he will for himself, though I deny his right to choose for his children according to his folly.

Therefore, for the occasionally honest practitioner of irregular methods, of confined scope and of ill-furnished mind, one may have no special condemnation. For the patient who likes that sort of thing one has no special pity when he gets it, but, on the contrary, for the practitioner

who understands thoroughly his own shortcomings and makes claims which are great in the inverse ratio of his performance, polite English is inadequate. This class includes all those who make claims of curing diseases they cannot cure, and which they know they cannot cure; all those who exploit remedies for a number of different diseases, although the remedy may have a chance of benefiting one of the diseases mentioned; all those who manufacture remedies to which there is nothing but a name, a harmless substance and a pigment; all those with whom the monetary agreement is all and the treatment nil. Delicacy forbids one from describing definitely the degrees of sanguinary folly exhibited by their victims. With these last we all are more definitely concerned, inasmuch as their prosperity, nay even their existence, depends ultimately upon the good faith that exists between patient and physician. There is even a touch of heredity in this, because through long generations there has existed a bond of honour between patient and physician; so that the quack's victim like some tamed wild animal is willing to approach the thicket without seeing the gin that is concealed therein. The approach of the victim to the trap is not always so ingenuous, and, although we are told that in vain is the net spread in the sight of any bird, yet we are also told that there are certain foolish avians of the puffin and guillemot species that can be knocked over with a stick. One need not have more consideration or pity for the knowing victim of the nostrum than for the foolish puffin or the unwise guillemot. After all, does not the earth need to be fertilized?

The word "charlatan" is said to be derived from Ceretano, a town in Italy, whence the first hippocratic impostors sallied. Knowledge was not so much necessary as assurance, and opportunity had much to do with their success. But opportunity could be created. I find a story of a physician in Paris, who used to send his servant at day-break to the principal mansions to enquire for his master, who was to repair to such and such a Prince who was dying. Finding that his master was not there, the servant would say, "Is this not the house of the Duke of —? I have made a mistake." The servant would proceed from street to street awakening the neighbourhood. You will remember how exactly this parallels the method pursued by the ingenious Bob Sawyer in "Pickwick Papers," whose boy would leave a series of bottles at a series of houses, and would later in the day call for them, exclaiming "left by mistake—so much business—from Sawyer's—late Nockemorf."

I will be loathe to believe that Dickens manufactured this from the preceding story, for, as a profession, we can scarcely spare Messrs. Bob Sawyer and Ben Allen.

Another gentleman of the profession, I fear an irregular one, when he arrived in the town would send out the bellman offering fifty guineas' reward for a lost poodle belonging to Dr. ——, Physician to the Royal Family, Professor of Medicine, Surgeon General, who was temporarily putting up at such and such an inn.

The quack is not an easy term to define, and to-day there are even sadly misled men of technical education whose modes of procedure lay them open to the charge of following this ancient order. Sometimes, too, the most respectable practitioner, by reason of ignorance, may come not very far short of the more impudent and not much more ignorant quack. I recall in my own acquaintance an old chap who practiced among the negroes of the Middle States, who at times seemed to come perilously near the debatable ground. I remember how he outlined the treatment of a lobar pneumonia in a man of seventy-five. With a strong nasal twang, he declared, "I give him a powder every six hours; each powder contains one grain of bromide, to allay the nervous irritation, and one grain of quinine, to keep down the fever, and one grain of bismuth to allay the irritation of the stomach." Peace to the ashes of the patient! One questions if the most arrant quack could have done much less.

Eighty years ago, if you had walked up Harley Street, you might have found the roadway blocked with carriages and a steady flow of patients in and out of the door whose plate bore the name of Mr. John St. John Long. He was an Irishman, and at this time was about thirty years of age. His medical education consisted of some months spent in coloring anatomical drawings for the professors of one of the London schools, from which knowledge he derived the invention of a liniment, which cured gout, rheumatism, palsy and consumption. It also distinguished between healthy and diseased tissues. He was accustomed to rub this preparation on the chest or on the back, and, if the patient were sound, no result occurred. In the presence of disease, however, an issue was formed, which was the sign of the disease making its way out. The issue he covered with cabbage leaves, and when the sore healed up the disease was cured. He also condescended to use inhalations which were taken by the patient from a large wooden box like a piano case; into holes in the sides of this box were fixed pipes; some mixture was burned inside the box, and the patients sat around and choked themselves with the smoke. His most successful business was not to treat the sick, but to treat the well. Having fixed upon a healthy person, whose cure would involve to him no risk, he needed only to look fixedly a few times at the victim before the latter naturally began to feel the workings of disease. A course of treatment with a good prognosis in such a patient was naturally fol-

lowed pretty frequently by good results. An eye-witness states that Long's bank book in 1830, during twelve months, showed deposits of £13,100. Socially, Long was very popular, especially with womankind. He was a good horseman, hunted regularly and was a confirmed bachelor. It must be admitted in his favour that scandal never blew its breath upon him. His Waterloo came in 1831, when his famous issue, on the back of a young Irishwoman, who was in comparatively good health, brought about gangrene, and Benjamin Brodie being finally called in, found her moribund. The autopsy report for the coroner reads a little peculiarly, although it has nothing to do with the salient features of the case:— "The lung had in its superior part, an adhesion connected with a cicatrix which had arisen from an old attack of bronchitis. The lungs appeared of a dark greenish-blue exteriorly, and of a port wine hue interiorly." When one thinks of post-mortems, one seems to recall having seen that appearance before. As usual, the medical experts were very contradictory. The judge showed strong bias towards the prisoner, but the jury brought in a verdict of manslaughter. Some of the evidence in favour of the prisoner's character is almost amusing. One lady had been cured of consumption by him, because before she had been rubbed she had had a cough, and after it the cough left her. One gentleman had had gout for twelve years and had attacks every four to twelve weeks. Long had cured him, for now he had had no attack for five weeks. The Marchioness of Ormond stated on oath that she knew the victim's back was rubbed with the fluid she and her daughters used. A cruel lawyer made her admit that she neither saw the back rubbed nor yet the fluid taken from the bottle. Sir Francis Brodie had asked Long if his lotion could give the Marquis of Anglesey a new leg in place of the one that that gallant soldier had lost at Waterloo. Long thought he could; the liniment was applied and succeeded in producing a big toe. But to return to the case, Long blamed the victim's death upon Brodie, who, he said, had killed her by a saline draught, which contained twenty grains of potassium carbonate, and one drop of tincture opii. The good Benjamin himself evidently was a little homeopathic in those days. Long was sentenced to £250 fine and to be imprisoned until it was paid. It was paid at once, and so he lived to fight another day and killed an old lady a few months later. In the case of the righteous man, his works follow him, but Long followed his works at the age of thirty-seven, of consumption, which he declined to have treated by his own methods. A costly monument holds him down in Kensal Green cemetery.

The most finished quack that ever lived in modern times was that man whose name is almost a household word in eighteenth century history,

Count Cagliostro. Probably no man ever succeeded in "doing the world so consistently, so continuously and so thoroughly." Fiction has dealt with him again and again. Alexander Dumas, in "Joseph Balsamo," has depicted him. He appears in succession in several of the later works of the Three Musketeers series, and even sober Thomas Carlyle has counted him worthy of note in the "Diamond Necklace." His medical education we can quickly dispose of, for he had none whatever. He was a Sicilian named Balsamo, and from his childhood was a thief and when he became sufficiently old he forged. With another youth of the same kidney he travelled through Greece, Egypt and Asia Minor, giving exhibitions of magic. Pope Clement XIII favoured him, as did many great potentates later. He married an Italian, and by 1771 they had made Barcelona, Madrid and Lisbon too hot to hold them, and came to England. England did not prove sufficiently easy, and the police were rather troublesome, so our friend Joseph appeared in Paris as the Marquis de Balsamo. Here he rejuvenated the aged, concocted poison, made gold, softened marble, improved beauty, made pearls and diamonds grow larger, and made also the philosopher's stone. Six years later, he was back to England, where he was imprisoned, but on his release he once more played the great lord. In 1777, he was made a Free Mason, and the Free Masons he certainly "worked" to his heart's content. It was thought that the subsequent splendor in which he often lived was financed by that long-suffering Order. One can judge to what an extent he fooled people when one realizes that in Courland the people wished to dethrone the reigning Duke and put Cagliostro in his place. I cannot find what streak of modesty prevented his accepting this offer. The Russian Empress Catherine II looked favorably upon him, but he had some very bad luck in Russia, for he successively failed to cure blindness, baldness and deafness. Calling himself a colonel in the Spanish army the Count did not succeed in hoodwinking the Spanish ambassador, and betook himself to Warsaw, thence to Strassburg, and finally he caught his biggest fish, Cardinal de Rohan, who was victimized for many million francs. In 1785, he was once more in Paris, and although extremely unpopular with the Faculty of Medicine, he had the rest of the city beneath his feet. Rumour says two medical students played a trick upon him at the instigation of some of their seniors. One of them described a very strange set of symptoms, but, unfortunately, did not take care to use the language of the laity. Cagliostro speaking to his companion said, "I will cure your friend in sixteen days; I will keep him isolated and in that time I will give him sixteen ounces of food in sixteen separate meals." This being rather more than he had bargained for, the student asked for the name of his disease; Cagliostro wrote on a piece of paper, "Superabundance of

bile in a gentleman of the Faculty." About this time came the international affair of the Diamond Necklace, and although one may read a good deal about it, it is hard to tell who stole the Diamond Necklace from whom? At any rate, the King excused the Count from further residence in Paris, and the Count excused himself from paying his rent. He offered to light the town of London by sea water, which he could render inflammable as oil, but that cock would not fight, and in 1787 he left London for the last time, on this occasion forgetting his wife, who immediately made public his entire career. In spite of this they were again reconciled and both fell into the hands of the Inquisition in 1789. One night Cagliostro was taken to the fortress of San Leo in the Duchy of Urbino, at which moment he disappears absolutely from human ken. One must admit that he did things stylishly. He called himself Grand Kophta of Egyptian Masonry, inventor of the Elixir of Life, the Elixir of Youth, of the Wine of Egypt (active principle cantharides), inventor of the Pentagon, which regenerated man and restored him to his primal innocence, and finally the Raiser of the Dead.

A contemporary of Cagliostro in England was one Graham, who became the rage of his time in London; he built at an expense of £10,000 a Temple of Health, which was lavishly decorated, and in which orchestras dispensed music and Graham dispensed salve. A well-built damsel personated the Goddess of Health, and it is said that Emma Hamilton, of Nelson notoriety, at one time filled this high position. The proprietor delivered a lecture, at the end of which the audience got a mild electric shock transmitted from their chairs. From all one can learn, I am afraid that under the laws of to-day Graham's Temple of Health would probably come under police notice.

One sees how difficult it is to draw the line between quackery and ordinary professional ignorance if one goes back to the time of Queen Anne, when medical works of the time would suggest the use of medicines made from "live hog lice," "new gathered earth worms," "sea-horse tooth rasped," and so on, or when a black powder was used for smallpox, which black powder consisted of the final remains of thirty or forty live toads burned in a new pot. In one place I find that this remedy is ordered to be taken in doses of half a dram, and the author states, "It is a certain help for such as are ready to die." At this time, too, epilepsy was sometimes treated by a powder made of dried ravens' flesh, dried viper and cinnamon. At the same time, of course, one must remember that even then the Jesuits' bark, as quinine was called, was used for the ague, and the standard remedies of bleeding and purging did bring about oftener good effects than bad; but when the Royal College of Physicians was almost ready to celebrate its two hundredth anniversary, and the

great Radcliffe, Sloane (the founder of the British Museum), and Mead walked the streets of London, yet their good mistress, Queen Anne, still practiced touching for the King's evil, as scrofula was then called. The Royal touch was supposed to cure, but one notes that after the touching, the sick cases were given into the hands of the physicians and the well cases did not need it, so that perhaps there was some excuse for the people's belief in that peculiarly sovereign remedy. It appears that everyone so touched was presented with a medal, and one suspects from contemporary evidence that patients were occasionally detected coming to the royal presence for a second or third time. Queen Anne, however, does not seem to have had a very exact eye for a real physician, for she knighted one William Reed, an oculist, for his great services in curing a great number of sailors and soldiers. This same Reed, who, when he became very prosperous, had Lady Reed attend some of his patients, appears to have been an utter impostor. His life shows how far, in Dr. Johnson's words, "impudence will carry ignorance." It is said that he could not read; he began his life as a tailor and later became an itinerant quack. He advertised most consistently, and published, in 1706, a book, which, as he could not write, must have been written for him. When he died, his widow, "obedient to the heavenly will," kept on the business in the Strand. Shortly before this, one named Joshua Ward, of a good family, had attained a wonderful degree of popularity by the efficacy of his famous drops and pills. His drops and his pills, the latter in three varieties, blue, red and purple, contained antimony and arsenic. Notwithstanding the unlawful trend of his practice, he built a hospital in Pimlico for the poor, and also a kind of dispensary in Threadneedle Street. In speaking of dispensaries, it may be recollected that in the last decade of the seventeenth century the College of Physicians made a strong fight against the apothecaries. All medical men were at this time physicians, surgeons and apothecaries, and the last named thrived so well that the College set up a dispensary to sell medicines to the poor at cost price. It may be recalled that Sir Samuel Garth, in 1699, wrote a very long and dreary poem, entitled "The Dispensary," in connection with this movement. You will probably remember that Garth was responsible for the proper burial of the poet Dryden, which took place from the Royal College of Physicians to Westminster Abbey. Had it not been for the College and its authorities, the poet would have been buried in utter obscurity.

The world does not change. I have before me an extract from the "patter" of a quack in 1700. Here are the same sounding names that mean nothing; here is the same disquisition upon the various forms of disease that one remedy can influence; here is the same outward applica-

tion which will not lose its virtue by time; here is the same high price for the same valueless commodity that one can find too often in our own drug-stores to-day, and doubtless the same fool to listen to it and use it then as now.

LeSage has described in Gil Blas the experiences of his hero, who, at a tender age, became assistant to a physician of Valladolid. Dr. Sangrado I suspect to be a fairly true picture of many physicians of his time in Spain, if not elsewhere. He wore long flowing robes, and all the medicine that Gil Blas learned was that bleeding and drinking hot water were sovereign remedies for anything. "In my first few weeks' apprenticeship, I was deputed to take down the names of those upon whom the doctor was to call. It was a kind of mortuary register, wherein I, like a booking agent, would reserve places for those who were about to travel to the next world. After six weeks, when I was thinking of running away, I was promoted to visit the doctor's poorer patients. I had but indifferent success, and once fell to blows with another practitioner, who was retained on the case while I was dismissed. My devoted tutor never ceased to extol the virtues of water as a beverage, and one day when I returned home unmistakably drunk on the proceeds of my half day's practice, I had, by reason of the wine I had consumed, a great thirst. My master would never be done commending me for the huge draughts of water I took, and when I said I would exchange a barrel of wine for a pint of water he applauded and rewarded me. I decided I would repeat the process every day, so that my unnaturally stimulated thirst for water might not abate.

"Then came the plague and the smallpox. Never a day but Dr. Sangrado and I saw eight or ten patients each. Rarely did we see our patients thrice. On the first occasion we treated them; on the second we learned that they had just been buried, or were at that moment in the agony. Devil take it, such a city for funerals. In a few weeks we had caused as many deaths as the siege of Troy, and I was as yet but a young practitioner comparatively unaccustomed to murder. Almost every day our house was visited by a father from whom we had taken a son, or an uncle seeking revenge for a nephew. Not many husbands came to complain of the loss of wives."

All this makes one think that the Harley Street of the nether world will be a long one!

I have spoken of a few of the pirates of medicine, and though the ships that carry the black flag are at times prosperous, the keels that carry the regular flag win ultimately. We are not all line-of-battle ships, but a little one gun sloop with the ensign is more honourable than a 40-gun frigate that is a buccaneer.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

EDITED BY

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THE CANADIAN MEDICAL ASSOCIATION AT WINNIPEG.

Elsewhere in this number will be found information relative to the meeting of the Canadian Medical Association at Winnipeg on August the 23rd, 24th and 25th. The meeting promises to be a very successful one, for the committees have been very active in their exertions, and are sparing no pains to further it. The meeting of the British Association will immediately succeed it, and while comparatively few are members of both, it may be borne in mind that local associate members are every year welcomed into the ranks of the latter organization. More than usual interest belongs to Winnipeg as the place at which the meeting is to be held; its rapid growth, its great importance in the financial world, its position at the threshold of great Western Canada, and its natural characteristics should prove an attraction to every member of the Canadian Medical Association. The fact that exceptionally cheap travelling rates can be obtained, not only to Winnipeg, but even to the Coast, and to the Seattle exhibition, should determine many in favour of attending the meeting. We predict that medically and otherwise, a most profitable journey can be made to Winnipeg for this meeting.

SANE TREATMENT OF THE INSANE.

Every practitioner of experience has found how limited is his knowledge in diagnosis, treatment or in prophylaxis of the cases of mental disease which are grouped under such headings as hysteria, obsessions, phobias, and so on; and whether these have been considered as forms of

insanity or not, he has perhaps found that the subsequent history of the case has proved that, if curable, it was not cured. Nor has the practitioner in his mental armamentarium any weapon upon which he can place reliance.

The training requisite for a physician before he is really fitted to deal with such cases successfully, can be acquired, but its demands are so great that we cannot hope that many physicians are willing to undergo it. The bright side of the picture is shown, however, by the fact that clinics do exist in which these forms of disease are rationally dealt with; such in this country are the Psychiatric Department in the General Hospital, Toronto, and the elaborate institution which is being added to the Johns Hopkins' Hospital at Baltimore. In this issue, Dr. Ernest Jones, of Toronto, gives a brief outline of the psychological methods that underlie psycho-analysis; this method aims at putting the cure in a sense in the patient's own power, or at least in making him work out that degree of salvation which he is to find. The physician by constant and close analysis of the patient's ideas seeks to lead him in directions of mental rectitude. On the face of it, it seems a more rational procedure than that of suggestion, which covers up rather than removes the errant ideas. The reader will gather from this paper some idea of the untiring patience and expense of time involved; for example, a case is cited upon which an hour daily for three years was spent. The stake played for is large, and reckoned even monetarily, the outlay is small compared with the loss to the world of the value of a human mind, plus the cost of hospital-refuge for the long remnant of a lifetime. It seems undoubted that the spread of sane and reasonable methods in the treatment of "border-line cases" will come about only by the multiplication of institutions and the education thereby of a constantly increasing number of physicians qualified to attempt the mending of the most intricate mechanism in the animal world.

CENTRALIZATION IN PUBLIC HEALTH.

The provincial health officer of Ontario contributes this month a paper dealing with the need of control or oversight of local boards of health by a central power. Possibly Dr. Hodgetts' position prevented him from speaking as strongly as he might in favour of control such as he exercises in Ontario; it is of our own knowledge that we say that Dr. Hodgetts has at times seen strong cause to exercise his authority over local boards; a striking example was the scandalous falsification of small-pox returns last year in some counties of Eastern Ontario. On a larger scale, who that is interested in hygiene can fail to remember the

fact that the United States Government had to take by the throat the State of California, when the latter not only failed to deal with plague, but openly denied the existence of the cases?

We have in these columns frequently advocated the principle that many questions of health, such as the tuberculosis question, are of such immense importance that they demand national handling. Why should we not have a Minister of Public Health? There are ministers at Ottawa, whose departments in all their widest relations do not concern one-half as great an expenditure as is involved in the questions that would be governed by such a minister. How many lives, how much money, think you, could be saved to Canada if, for the coming month of August, pure milk could be secured to the cities?

We are far from saying that the institution of a federal control of health affairs would begin the millenium. Such a bureau would have numberless difficulties, would make endless mistakes, without doubt, but it would be in the hands of men whose business these things are; as it is, our health officers are physicians with other interests, and their civil relationships are such that at times they dare not exert their power upon the individual for the sake of the community. Yet this is one thing that is required; the interest of the one must yield to that of the many; and if the one object, the central department has as a duty to see that the one yields all the same. This is apart from the question that medical health officers are often not enthusiastic hygienists, and very often are not trained ones.

But one might multiply arguments in favour of this view. The main reason in Canada why a central department of public health has never been formed is that people are too busy doing other things; and strange as it may seem, in the mass we are much more careful to prevent attacks upon our pockets than upon our health.

Reviews and Notices of Books.

ELEMENTARY PRACTICAL TREATISE ON DISEASES OF THE PHARYNX AND LARYNX. By DR. E. J. MOURE, Surgeon in charge of the Nose, Ear and Throat Department of the Faculty of Medicine, Bordeaux. Translated and adapted by J. MALCOLM FARQUHARSON, M.B., F.R.C.P., Edin., Lecturer on Diseases of the Nose, Ear and Throat in the School of Medicine of the Royal Colleges, Edinburgh; Surgeon, Ear and Throat Department, Royal Infirmary; and Senior Surgeon to the Ear, Nose and Throat Department of the Eye and Ear Infirmary, Edinburgh. With 210 illustrations. Rebman and Company, 1123 Broadway, New York. Price $4.00.

The author in his preface states that he has endeavoured above all to write a book complete enough to furnish the general practitioner with useful information regarding those affections with respect to which he is not always conversant. In this, it would seem, he has been successful, and has furnished a book valuable to both the general practitioner and specialist. The book, which is divided into two parts, consists of 403 pages, and contains very excellent plain and coloured plates helping very materially to an understanding of the subjects discussed. From the thoroughness displayed it seems almost a pity that the naso-pharynx has not been included.

Part I deals with the anatomy and physiology of the pharyngeal cavity, Chapter I being devoted to the anatomy and examination of the pharynx, Chapter II, to the pathology of the pharynx, the rarer and more common diseases being discussed impartially with their appropriate treatment. After a comprehensive description of diseases of the tonsils, the subject of tuberculous angina is taken up, acute miliary tuberculosis of the pharynx being described, nothing, however, being said of its rarity. This the author divides into (a) ulcerative and (b) vegetative forms, the latter being of a more chronic nature; he is of the opinion that it would appear to be intermediate between acute ulcerous and the lupoid variety. Under the chronic forms he places (a) The œdematous type, occurring in the tissues of the uvula, soft palate, epiglottis and sometimes the posterior pharyngeal wall. (b) Lupus. (c) Hypertrophic form. Syphilis, primary, secondary and tertiary, is discussed at length, the author then reverting to the tonsils, their hypertrophy receiving his attention. This he divides into three varieties: 1. The pedunculated. 2. The hooded. 3. The multilobular.

The treatment (a) medical; (b) surgical; tonsillotome, ignipuncture, the snare, cold or hot, and marcellement.

Tumours of the tonsils he divides into benign, malignant or mixed.

The benign including pseudo-polypoidal hypertrophy (a term with which we are unfamiliar), fibromata, papillomata and cysts.

The malignant are the sarcomata, scirrhus encephaloid and epitheliomata.

Chapter III is devoted to the pathology of the lingual tonsil, a subject which is perhaps deserving of more attention than is generally accorded it though its importance may have been exaggerated in some quarters.

Chapter IV consists of a discussion on the pathology of the soft palate. In speaking of paralysis of the soft palate, he draws attention to the fact that besides diphtheria, acute diffuse non-diphtheritic anginæ and peri-

tonsillar abscess may be causes, but omits to mention as another cause—over-distension or stretching by the finger clumsily introduced into the naso-pharyngeal cavity in the process of examination or in the removal of adenoids, especially in very young children.

In Chapter V is an interesting section on retro-pharyngeal abscess with four excellent coloured diagrams. Tumours of the pharynx and constriction of the inferior pharynx conclude Part I.

Part II deals with the larynx. Chapter I consists of a description of the examination of the larynx and trachea, including the method of Killian, with illustrations, superior bronchoscopy and lastly stroboscopy. The remaining chapters are devoted to diseases and traumatisms of the larynx. Besides the acute and chronic catarrhs, syphilitic laryngitis is fully considered with appropriate treatment.

Tuberculosis of the larynx in its various forms comes in for a lengthy and comprehensive discussion, occupying 36 pages.

Though the author furnishes us with nothing specially new in the treatment of laryngeal tuberculosis, he covers the ground pretty well up to date from a general and local (including surgical) standpoint, but in this tends rather to conservatism and rightly, we think.

A section on leprosy is introduced, but this in our opinion would be more a matter of interest to the general practitioner than likely to require treatment at his hands.

An excellent section on neuro-muscular affections of the larynx with illustrations occupies 49 pages.

Tumours of the larynx with their treatment, including laryngectomy and foreign bodies in the larynx with a section on laryngitis associated with eruptive fevers brings this complete and interesting volume to a close. The book contains a large amount of information, is well printed and illustrated and should fulfil the object for which it is intended.

W. H. J.

Aid to Forensic Medicine and Toxicology. By William Murrell, M.D., F.R.C.P. Baillière, Tindall and Cox, London, 1909.

This small book contains an excellent synopsis of the subjects usually found in text-books of forensic medicine and toxicology, but as in the great majority of medico-legal books so here no space is given to civil cases arising from accidents. It is desirable that writers of text-books of this nature should deal with wounds and injuries in their non-criminal aspect.

D. D. MacT.

VACCINE AND SERUM THERAPY. By EDWIN HENRY SCHORER, B.S., M.D., Assistant Professor of Parasitology and Hygiene, University of Missouri. Illustrated. Publishers: C. V. Mosby and Co., St. Louis, 1909. $2.00.

This book of one hundred and thirty pages gives a brief summary of the theories and practical application of vaccine and serum therapy. The greater portion of the book is devoted to opsonins, and the treatment by vaccines, as indicated by Wright and Douglas.

A short summary of the various theories of immunity is given, but this is almost too brief to be of any value. The technique for the determination of the opsonic index, and the methods in vogue for the inoculation of vaccines are well described, and give the reader a good idea of the difficulties in carrying out this treatment under scientific principles. The author admits that vaccine therapy may be carried on without the determination of the opsonic index in each individual case. A discussion of the nature of opsonins is also given, but we find that there is considerable repetition throughout the volume. Besides this, the author gives a brief review of the use of different antitoxic and antibacterial sera.

The book forms a good introductory study for those wishing to gain insight into the recent work on immunity, and more particularly opsonins.

O. K.

A THEORY REGARDING THE ORIGIN OF CANCER. By C. E. GREEN. Second edition. William Green & Sons, Edinburgh and London.

The book represents a most delightful jumble of facts, hearsay and opinion. As facts, the "mortality figures in some trades and professions, shown by the Registrar-General's returns," are cited. Hearsay evidence of agriculturists, respecting malignant tumours in plants, of cancer statistics among the aborigines, and of the blastomycotic nature of Russel's fuchsin bodies, etc., form much of the uncertain framework upon which the general theory is built.

The evidence and line of thought brought forward by the author to establish his contention often appear childish. The author holds to the parasitic theory, but believes that sulphuric acid plays an important role in altering conditions in the animal cell which favour the growth of the parasites. For this reason our chimneys (soot contains ammonium sulphate), beer (containing sulphite of lime and sulphurous acid), harness polish, and a great many substances of our domestic environment are blamed for the initial changes inducing cancer. The London air, too, containing "enormous" quantities of acid is conducive to cancer.

The reasoning is frequently difficult to follow. Outside of dealing in generalities the author appears to have no knowledge of cancerous growths.

O. K.

THE PSYCHOLOGY OF DEMENTIA PRAECOX. By DR. C. G. JUNG. Privat docent in Psychiatry, University of Zürich. Authorized translation with an introduction by Frederick Peterson, M.D., Professor of Psychiatry, Columbia University, New York; and A. A. Brill, Ph.B., M.D., Assistant in Psychiatry, Columbia University, New York. Nervous and Mental Disease, Monograph Series, No. 3. Journal of Nervous and Mental Disease Publishing Co., 1909. $2.00.

This monograph on dementia praecox maintains the high standard of excellence set by its two predecessors; it is a work of 153 pages with an introduction by the translators. It is a study of the individual psychology and the influence of the individual on the picture of the mental disease. It shows how the complex still has its influence and the repressed wishes of life tend to become actualized. The chapter entitled "Dementia Praecox as a Paradigm," is a careful analysis of the association processes in a typical case and is most interesting and suggestive—showing the author's method of studying such cases. The translation is well worthy of the original.

C. K. R.

A POCKET FORMULARY. By E. QUIN THORNTON, M.D., Associate Professor of Materia Medica, Jefferson Medical College, Philadelphia. Lea & Febiger, 1909.

The appearance of the 9th edition of this work would seem to indicate that it is appreciated by at least a fair proportion of medical practitioners. As a collection of prescriptions it undoubtedly is excellent. The arrangement is good, and the addition of "Indications for Use" adds much to its value. But while such a work may be of service to a certain number, it is impossible to recommend it to the average young man who is just beginning the practice of medicine. The aim of the modern medical school is to teach the student to think for himself, and in no branch is it more necessary that he should do so intelligently than in the drug treatment of disease. This work, excellent though it may be in some respects, cannot do other than foster a disinclination for the thorough investigation necessary for intelligent prescribing.

J. W. S.

RATIONAL IMMUNIZATION IN THE TREATMENT OF PULMONARY TUBERCULOSIS AND OTHER DISEASES. By E. C. HORT, B.A., B.Sc., M.R.C.P. William Wood & Co., New York, 1909.

In this book the author discusses the various forces exerted by the body against bacterial invasion. The author attacks the subject of immunity in tuberculosis from a new point of view, which, although not entirely original with him, is original as far as the practical application of the subject is concerned. Although the author suggests a practical and theoretical application of diverse immune forces, he gives little or no clue how these are to be carried out.

The author finds the opsonic index unreliable, and points out that the estimation of the immune substances in the body, as regards a certain infection, cannot be gauged by the antibacterial bodies alone, but that consideration must be given to autolytic and other cell enzymes, liberated during an infection. The author, too, does not appear enthusiastic in the treatment with bacterial vaccines, but believes that well regulated auto-inoculations are of more value. How such auto-inoculations are to be regulated, he does not explain. The last chapter of the book on autolysis and anti-autolytic defence is a very good summary of the subject.

O. K.

Medical News.

We reprint from the *Quebec Daily Telegraph*, of July 14th, 1909, a clipping reinserted from their columns of 1859. Dr. Hall's name is familiar to the medical men of the older generation:—

Dr. Archibald Hall was elected at this time fifty years ago to be the president of the College of Physicians and Surgeons of Lower Canada. Dr. Hall, who was one of the most prominent members of the medical profession in Canada, and who was a licentiate of the Royal College of Surgeons of Edinburgh, was born in Montreal in 1812, and educated chiefly at the Royal Grammar School of that city. He was indentured to the late Dr. W. Robertson, and studied his profession first at McGill University and then at Edinburgh. As a collateral branch of medical study, Dr. Hall devoted himself very much to the natural sciences, attaching himself particularly to botany, zoology and meteorology. Bringing with him from Edinburgh a fine collection of the plants indigenous to the neighbourhood of that city, he began, soon after his return, the foundation of an herbarium of the plants growing about Montreal, and sent home to his Alma Mater, in the course of a few years, a very large and carefully prepared collection. Zoology appears to have been, however, his chief delight, and in 1839 he had received the silver medal of the Natural History Society of Montreal as the successful competitor for a prize offered by that society for the best essay "On the Zoology of the

District of Montreal." The work is a voluminous one, but in consequence of the limited time allowed for its preparation, its contents were limited to birds and mammals. So complete is it that only one or two other varieties could now be added to the list, and those of considerable rarity. Some twenty years later the essay was printed in the *Canadian Naturalist*, its publication running through several years of that useful and now rare publication. For some years Dr. Hall was the editor of *The British American Journal of Medical and Physical Science*, which was in existence from 1845 to 1852, and from 1860 to 1862. In 1842, Dr. Hall had written "Letters on Medical Education addressed to the members of the Provincial Legislature of Canada," and in 1860 appeared his "Biographical sketch of the late A. F. Holmes, M.D., LL.D., including a history of the medical department of McGill College." Not only did he hold several professorships in the Medical Faculty of McGill, but he was also for sixteen years one of the attending physicians at the Montreal General Hospital, and was also for twelve years physician to the Ladies' Benevolent Society and to the old House of Industry.

MANITOBA MEDICAL ASSOCIATION.

At the annual meeting of this Association held June 22nd and 23rd, the following officers were elected for the ensuing year:—

President—Dr. W. Harvey Smith, Winnipeg.

First Vice-President—Dr. H. E. Hicks, Griswold.

Second Vice-President—Dr. J. S. Matheson, Brandon.

Honorary Secretary—Dr. J. Halpenny, Winnipeg.

Honorary Treasurer—Dr. Robt. F. Rorke, Winnipeg.

Executive Committee—Dr. H. A. Wright, Oak Lake; Dr. F. S. Keele, Portage la Prairie; Dr. D. G. Ross, Selkirk; Dr. H. M. Speechly, Pilot Mound; Dr. W. J. Harrington, Dauphin.

Auditors—Dr. R. J. Blanchard, Winnipeg; Dr. A. W. Moody, Winnipeg.

CANADIAN MEDICAL ASSOCIATION, 42nd ANNUAL MEETING

WINNIPEG, AUGUST 23RD, 24TH AND 25TH, 1909.

The Standard Certificate Plan prevails in every province, no one requiring any certificate from the General Secretary. This means that all delegates on purchasing single first class tickets to Winnipeg for themselves, their wives and their daughters, should ask for, and get at the same time, a Standard Convention Certificate from the Ticket Agent for each, paying single fare, plus 25c. These should be immediately

placed in the hands of Dr. C. H. Vrooman, Winnipeg, at the Transportation Office. When signed by him they will entitle the holder thereof to reduced transportation on return journey. East of Port Arthur, if fifty are present with certificates, return will be free; as far west as Laggan and Coleman, single fare if a hundred are present with certificates. British Columbia points single fare.

Railways and Steamboats.—The Canadian Pacific Railway, the Grand Trunk Railway, the Intercolonial Railway, the Canadian Northern Railway, the Richelieu and Ontario Navigation Company, the Northern Navigation Company and the C.P.R. Steamboat Service are included in the transportation arrangements. On upper lakes $4.25 additional each way.

Tickets Going and Returning via Chicago.—Arrangements have been made for tickets routed *via* Chicago and Northwestern Railway for ten days' stop-over on return journey at Rochester, Minn., on payment of $1.75 extra—fare St. Paul to Rochester. Coupons of tickets reading St. Paul to Chicago will then be honoured from Rochester to Chicago.

Comparative schedule of transportation rates to Winnipeg:—

Windsor	$26 05
Chatham	26 05
London	26 05
St. Thomas	26 05
Woodstock	26 05
Galt	26 05
Toronto	26 05
Guelph	26 05
Hamilton	26 05
Peterboro'	27 95
Ottawa	32 60
Montreal	36 00
Kingston	30 95
Quebec	40 00
St. John, N.B.	44 45
Halifax, N.S., via Digby	47 95
Sydney, C.B.	52 95

Dates of Sale of Tickets, Side Trips, Time Limits, Etc.—Tickets will be on sale, Halifax to Fort William, August 14th to August 21st; British Columbia points, August 16th to 19th. Final return limit, September 25th. Eastern delegates may arrange side trips for lowest one way first-class fare for round trip to points in Manitoba, Alberta and Sask., and to points in B.C. (except B.C. coast points, when Alaska-

Yukon-Pacific Exposition will apply) from August 24th to September 25th.

Place of Meeting in Winnipeg.—General meetings will be held in the Sunday School of the Broadway Methodist Church; and the Sectional Meetings in the Science Building of the University of Manitoba. Clinics will be held in the Winnipeg General Hospital and in St. Boniface Hospital. Registration Offices, etc., exhibitions in tents at entrance to University Grounds.

Hotel Accommodation.—Delegates should apply immediately for hotel accommodation to the following hotels or to Dr. W. Rogers, Canadian Northern Building, Winnipeg.

Royal Alexandra Hotel—350 rooms, $4.00 to $10.00 a day—European plan only.
Empire Hotel—60 rooms, $2.50 a day—American plan only.
Clarendon Hotel—130 rooms, $2.00 to $6.00 American, $1.00 European.
Grange Hotel—22 rooms, $2.00 to $3.50—European only.
Mariaggi Hotel—80 rooms, $2.00 to $3.00—American only.
Leland Hotel—80 rooms, $2.00 to $3.00—American only.
Corona Hotel—60 rooms, $2.50 American, $1.50 European.
Strathcona Hotel—90 rooms, $1.50 to $2.50—American only.
Winnipeg Hotel—60 rooms, $1.50 to $2.00—American only.
Deer Lodge Hotel (one mile out of city)—25 rooms, $1.00—European only.

Membership.—The fee for membership is $5.00. Pay to treasurer, Dr. H. B. Small, Ottawa, at any time. New members should apply at meeting to General Secretary for membership blanks and instructions as to becoming members. The transportation arrangements apply to them as to members.

The Social Side at Winnipeg.—Visiting ladies will be entertained by Mrs. H. H. Chown at afternoon tea at St. Charles Country Club at 5 p.m. Monday, August 23rd. Mayor Evans will welcome the members of the Association at the evening meeting in the Royal Alexandra Hotel, Monday. Dr. Blanchard will deliver the Presidential Address. Members and ladies will be entertained at a conversazione at 9 p.m. in the Royal Alexandra. On Tuesday, August 24th, there will be a Garden Party at 5 p.m. Wednesday at 5 p.m. automobile ride for visiting ladies. At 8.30 p.m. there will be a Smoker in the Royal Alexandra, preceded by an address.

Additional Information.—Additional information of a local character may be obtained from Dr. Harvey Smith, 26 Canada Life Building, Winnipeg. Any general information from the General Secretary, Dr. George Elliott, 203 Beverley Street, Toronto.

Canadian Medical Protective Association.—The annual meeting of the Canadian Medical Protective Association will be held in the afternoon of Wednesday, when the President, Dr. R. W. Powell, Ottawa, will submit his annual report.

Provisional Programme.—Presidential Address—Dr. R. J. Blanchard, Winnipeg.

Address in Medicine—Prof. J. George Adami, Montreal.

Address in Surgery—Dr. James Bell, Montreal.

General Meeting—Symposium on the Kidney.

Dr. John McCrae, Montreal; Dr. J. T. Fotheringham, Toronto; Prof. J. J. Mackenzie, Toronto; Dr. R. P. Campbell, Monfreal; Dr. S. Cummings, Toronto; Dr. Walter McKeown, Toronto; Dr. Geo. E. Armstrong, Montreal.

Medical Section—

Title to be announced—Dr. R. G. Brett, Banff.

The Functions and Relations of the Olivary Body—Dr. A. T. Musson, Montreal.

Primary Anæmia—Dr. E. W. Montgomery, Winnipeg.

The Home Treatment of Pulmonary Tuberculosis—Dr. J. H. Elliott, Toronto.

Out-Patient Clinics for Tuberculous Poor—Dr. H. C. Parsons, Toronto.

Recent Methods for the Diagnosis of General Paresis—Dr. Charles Clarke, Toronto.

The Pathology of General Paralysis—Dr. Ernest Jones, Toronto.

Duodenal Ulcer—Dr. Charles F. Martin, Montreal.

Sources of Infection in Tuberculosis—Dr. Geo. D. Porter, Toronto.

A Report on the Results of Operations in Nine Cases of Cerebral Tumour—Dr. D. A. Shirres, Montreal.

Prairie Dietetics in Relation to Health and Disease—Dr. H. M. Speechly, Pilot Mound.

The Value of Preventive Medicine to the State—Dr. John Ferguson, Toronto.

Stokes-Adams Syndrome—Dr. John Macdonell, Winnipeg.

On some Neurological Subject—Dr. D. Campbell Meyers, Toronto.

The Occurrence of Adventitious Sounds in Normal Chests—Dr. R. D. Rudolf, Toronto.

Beri Beri—Dr. A. P. Proctor, Vancouver.

The Rights of our Children—Dr. C. J. C. O. Hastings, Toronto.

The Effects of Drugs on Bronchial Secretion—Dr. V. E. Henderson, Toronto.

Dietetics—Dr. E. S. Moorhead, Winnipeg.

Serum Therapy—Dr. Geo. W. Ross, Toronto.

Vaccine Therapy—Dr. Campbell Laidlaw, Toronto.

Pericarditis—Dr. J. S. Graham, Toronto.

The Relation of General Hospitals to the Community—Dr. R. W. Bruce Smith, Toronto.

Hospitals—Dr. Charles O'Reilly, Toronto.

Title to be announced—Dr. John A. Amyot, Toronto.

Suprarenal Glands—Dr. Swale Vincent, Winnipeg.

Movable Hypertrophied Spleen, with Report of Case—Dr. Paul, Fort William.

The Thyroid Gland—Dr. John Hunter, Toronto.

Title to be announced—Dr. James Third, Kingston.

Title to be announced—Dr. Graham Chambers, Toronto.

The Stomach—Dr. Hunter, Winnipeg.

Title to be announced—Dr. Clements, Toronto.

What is Certified Milk?—How may it be secured for our patients?—Dr. H. T. Machell, Toronto.

Surgical Section—

A Generation of Change—Dr. John Stewart, Halifax.

The Removal of Sigmoid Tumours—Dr. Wm. J. Mayo, Rochester, Minn.

Hydatids, with an Analysis of 103 cases treated in the Winnipeg General Hospital—Dr. Brandson, Winnipeg.

Stiff and Painful Shoulders—Dr. H. P. H. Galloway, Winnipeg.

General Peritonitis following Rupture of the Appendix—Dr. T. Shaw Webster, Toronto.

Some Practical Points in the Treatment of Appendicitis—Dr. Cecil A. Parr, Morden, Man.

Shall we Remove the Appendix when the Abdomen is Opened for Other Reasons?—Dr. A. Lapthorn Smith, Montreal.

The Use of Commercial Gasoline in the Surgery of Traumatism—Dr. B. L. Riordan, Toronto.

Rectal Anæsthesia—Dr. W. Webster, Winnipeg.

Methods of Inducing Local Anæsthesia—Dr. T. E. Lehman, Winnipeg.

Exhibition of Chloroform Apparatus, with Observations—Prof. N. H. Alcock, London, Eng.

Anesthesia—Dr. Samuel Johnston, Toronto.

Title to be announced—Dr. Henry Howitt, Guelph, Ont.

Lantern Demonstration of Fractures of the Femur—Dr. J. Alex. Hutchison, Montreal.

Fractures and their Treatment—Dr. F. N. G. Starr, Toronto.

Fractures—Dr. Clarence Starr, Toronto.

Decapsulation of the Kidneys in Puerperal Eclampsia—Dr. Andrew Croll, Saskatoon.

Gall Stones—Dr. N. J. McLean, Winnipeg.

Title to be announced—Dr. John Gunn, Winnipeg.

Title to be announced—Dr. Hadley Williams, London, Ont.

Foreign Body in the Bronchus—Dr. Ingersoll Olmsted, Hamilton.

Experiences in Intestinal Surgery—Dr. J. F. W. Ross, Toronto.

Prostatic Obstruction—Dr. C. F. Gordon, Vancouver.

Title to be announced—Dr. Geo. A. Bingham, Toronto.

Title to be announced—Dr. H. A. Bruce, Toronto.

Title to be announced—Dr. A. Primrose, Toronto.

Title to be announced—Dr. F. LeM. Grassett, Toronto.

Title to be announced—Dr. E. B. O'Reilly, Hamilton.

Obstetrics and Gynæcology Section—

Address—Dr. Adam H. Wright, Toronto.

Immediate *versus* Delayed Operation in Ruptured Tubal Pregnancy—Dr. R. M. Simpson, Winnipeg.

Pathology of Uterine Hæmorrhage—Dr. F. Burnham, Winnipeg.

No More Craniotomies, or Accouchements Forcés—Dr. A. Lapthorn Smith, Montreal.

The Advantage of Vaginal Cæsarean Section where it is necessary to Empty the Uterus Rapidly, with Report of Cases—Dr. Cleland, Toronto.

Report of a Case of Abdominal Pregnancy Past Term; Operation; Recovery—Dr. W. J. Hunter Emory, Toronto.

Eye, Ear, Nose and Throat Section—

Address: Progress of Ophthalmology—Dr. R. A. Reeve, Toronto.

Address—Progress of Oto-Laryngology—Dr. Prowse, Winnipeg.

The Condition under which the Lachrymal Sac should be Excised, and the Best Method of its Performance—Dr. Good, Winnipeg.

Mastoid Disease—Dr. D. J. Gibb Wishart, Toronto.

Title to be announced—Dr. G. R. McDonagh, Toronto.

Title to be announced—Dr. Hunt, Fort William.

Retinal Affections of Renal Origin—Dr. Crosby, Toronto.

On the Injection of Serum in Ocular Trouble, with Report of Cases—Dr. Beaupre, Quebec.

Demonstration in Bronchoscopy—Dr. Chas. M. Stewart, Toronto.

Removal of Tonsils and Adenoids—Dr. Chas. M. Stewart, Toronto.

Sarcoma of the Nose, with History of Some Cases—Dr. Price Brown, Toronto.

Some Observations on the Surgical Treatment of Chronic Purulent Otitis Media—Dr. C. C. McCullough, Fort William.

Snow Blindness—Dr. V. E. Latimer, Brandon, Man.

Treatment, Lachrymal Sac—Dr. W. M. Brown, Neustadt, Ont.

New Forceps for the Removal of the Anterior Capsule Lens—Dr. F. Tooke, Montreal.

Case Report: Tumour of the Optic Nerve, with Specimen—Dr. W. Harvey Smith, Winnipeg.

Pathology—

Demonstration of Spirochaete in Congenital and Acquired Syphilis—Dr. Fletcher McPhedran, Toronto.

Methods of Detection of Typhoid Carriers—Dr. Black Leslie, ——

Title to be announced—Dr. O. R. Mabee, Toronto.

Paratyphoid—Dr. McWeeney, Dublin.

The Bacteriological Factor of Hemorrhage in Pulmonary Tuberculosis —Dr. Caulfeild, Gravenhurst.

A Serum Diagnosis of Syphilis in Connection with Pulmonary Tuberculosis—Dr. Caulfeild, Gravenhurst.

The Hospital Laboratory, with Special Reference to Diagnosis in Surgical Cases—Dr. Wilson, Rochester, Minn.

Parasites—Dr. Todd, Montreal.

Title to be announced—Dr. Gordon Bell, Winnipeg.

Papers from the Laboratories of the Royal Victoria Hospital, Montreal—

(1) The Distribution of Fat in the Liver—Dr. J. McCrae, Dr. Oskar Klotz.

(2) The Von Pirquet Tuberculin Reaction—Dr. A. C. Rankin.

(3) On the Demonstration of the Glands of the Ciliary Body—Dr. F. T. Tooke.

(4) Some Cultural Features of the Bacillus Mucosus Capsulatus—Dr. W. L. Holman.

(5) Concerning Compensating Hyperplasia of the Intima—Dr. Oskar Klotz.

(6) The Value of Aesculin Media in the Diagnosis of Bacillus Coli—Dr. Oskar Klotz, Dr. A. C. Rankin.

(7) Cyst of the Wall of the Carotid Artery—Dr. A. Freedman.

N.B.—The reading of all papers will be strictly limited to fifteen minutes; discussions, five minutes. Abstracts of papers should be in by August 1st. Address same to Dr. Harvey Smith, Canada Life Building, Winnipeg. Intending delegates will confer a favour by kindly notifying either Dr. Smith or the General Secretary at once of their intention to be present.

The Committee on Pathology are arranging for a special demonstration of the methods employed in the examination of excreta, stomach contents, blood, etc.

A large collection of pathological specimens from Toronto, Montreal and Winnipeg will be on exhibition in connection with the Section on Pathology.

Surgical clinics are being arranged in connection with hydatids.

Officers.

R. J. Blanchard, M.B., C.M., President; Dr. Geo. Elliott, 203 Beverley Street, Toronto, Secretary.

Committee of Arrangements—Dr. H. H. Chown, Winnipeg; Dr. W. Harvey Smith, Canada Life Building, Winnipeg; Dr. J. Halpenny, Assistant Secretary, McIntyre Block, Winnipeg.

Committee on Pathology—Dr. Gordon Bell, Chairman; Dr. S. Pierce, Secretary.

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Committee on Transportation—Dr. R. J. Blanchard, Chairman; Dr. C. H. Vrooman, Secretary.

Committee on Ophthalmology and Otology—Dr. S. W. Prowse, Chairman; Dr. T. Turnbull, Secretary.

Committee on Entertainment—Dr. Wm. Rogers, Chairman; Dr. C. C. Field, Secretary.

Committee on Finance—Dr. Brandson, Chairman; Dr. R. M. Simpson, Secretary.

Retrospect of Current Literature.

SURGERY.

UNDER THE CHARGE OF DRS. ARMSTRONG, BARLOW, ARCHIBALD, AND CAMPBELL.

DR. ERNST. "The Newer Treatment of Gonorrhœal Epididymitis with Personal Experience of the Puncture Method." *Berliner Kl. Woch.*, 1909, No. 10 and 11.

Regarding the treatment and prophylaxis of epididymitis, there are at present two schools. The one holds that as the infection is caused largely through irritation of the colliculus seminalis and a consequent reversed peristalsis along the vas deferens, it therefore should desist from all active measures so soon as an epididymitis declares itself and should be especially careful of any interference with the posterior urethra. Neisser's school, on the other hand, considers that active treatment is always necessary. The author commits himself to neither view, but in severe cases of urethritis desists from all treatment and in milder advocates mild irrigation and prostatic massage. Once the epididymitis has developed he stops all treatment, puts the patient to bed, if possible, applies ice, to be followed by heat or applications of ichthyol.

The compression method, "strapping," he considers of only historical interest. Biers' treatment has not been satisfactory in his hands, but on the other hand, on the basis of 52 cases, he warmly recommends "puncture." This he performs with a small syringe and needle, puncturing the cauda of the epididymis 1 to 2 c.m., and aspirating a drop or two of blood-stained serum. Anæsthesia is not necessary. Within 24 hours the swelling has appreciably decreased (though in some cases a repetition was necessary). Fever and pain disappear with the swelling. He has never seen any bad effects, and considers that the puncture allows a slight tear in the capsule which by relieving tension enables a better circulation to affect improvement.

ARTHUR JORDAN, Moscow. "Statistics of Arthritic Gonorrhœa." Moscow, *St. Petersburger Med. Woch.*, No. 5, 1909. *Zentralbl. f. Urolog.*, Bd. III, Ht. VII.

Among the complications of gonorrhœal urethritis "rheumatism" stands third, prostatitis and epididymitis being both more frequent, the latter occurring, according to the author, in 11.7 per cent. Fournier considers that arthritis occurs as a complication in but 1.6 per cent., and most statistics range from this to the 3.6 per cent. of Held. Bond, however, and the Copenhagen statistics for 1904 put its occurrence as

high as 10 and 11 per cent. These latter figures probably represent hospital cases only, and apparently cases which are admitted to the wards. For the percentage of cases in the Berlin polyclinic, out of 1,315 cases but 2 cases of arthritis occurred.

In private practice from 829 cases of arthritis in men, 18 or 2.1 per cent. developed urethritis.

The great majority (11) developed during the chronic stage, five developed between the 7th and 11th day, and the others during the first two months. As the chief causes, he considers trauma and cold as lowering resistance in the affected joints, perhaps also trauma to the urethra.

As to the prognosis—of the author's 18 cases, two disappeared, two developed ankylosis, five recovered with some slight stiffness and limitation of movement, and nine recovered completely.

JOHN W. H. EYRE, M.D., and BERNARD H. STEWART, M.A., M.B. "The Treatment of Gonorrhœal Infections by Vaccines." *Lancet,* July 10, 1909.

A short *resumé* of the literature dealing with the vaccine method as applied to gonorhœa introduces this subject, which has occupied the authors during a period of three years, and includes 53 cases from Guy's Hospital, The Lock Hospital and St. Paul's, chiefly ambulatory, but also in-door patients. Half of the cases showed some form of arthritis; iritis and septicæmia were also present. The remainder were cases of acute and chronic urethritis.

The diagnosis was made either by the finding of the gonococcus in smears or culture or by a persistent low opsonic index of the individual to the gonococcus. The treatment was controlled throughout by taking the index. All cases were treated by vaccine alone, with a few minor exceptions. The vaccine was prepared from fresh 24-hour blood agar cultures. The authors preferred an autogenous vaccine, but claim to have obtained almost as satisfactory results from a mixture of several strains which thus formed a polyvalent stock vaccine. In the earlier cases, doses of 100,000,000 to 500,000,000 were not infrequent, but were in authors' opinion too potent, especially if the vaccine was fresh. They never exceeded 25,000,000 in their later cases and could give such a dose at shorter intervals with greater benefit.

In acute urethritis the discharge could be diminished in every case and with rest in bed and perhaps an injection or two towards the end; they consider this the ideal treatment. In chronic urethritis a very definite value is ascribed to the vaccine. In orchitis and epididymitis and iritis, relief of pain followed very shortly. In arthritis they conclude

that vaccine has shown itself of very considerable value, though there are cases which do not appear to be much influenced.

Dr. A. Buschke and Dr. Harder. "Provocative Action of Sublimate Injections in Syphilis and their Relation to the Wassermann Reaction." *Deut. Med. Woch.*, July 1, 1909.

In 1902, Herxheimer and Krausel showed that, when the roseola of secondary syphilis showed but poorly, an injection of mercury caused it to suddenly declare itself. Welander tried a similar test during the primary stage and succeeded in 1 or 2 cases in causing the rash to appear.

The authors have tried the reaction in a large number of hospital cases and have succeeded in so many that they consider the test to be of value, as they are thus enabled to shorten the secondary incubation period and therefore to complete their diagnosis and begin treatment. They make use of sublimate injections in large doses (.04). Generally within 24 hours the exanthem appears. By excising a piece of skin and rash they convinced themselves that the rash was syphilitic, rather than mercurial, in so much as there were characteristic vascular changes.

No definite relationship between the reaction and the Wassermann reaction could be proven.

R. P. C.

OPHTHALMOLOGY.

UNDER THE CHARGE OF DRS. STIRLING, BYERS, MATHEWSON, MCKEE, TOOKE.

B. E. Fryer, M.D., and Jos. S. Lichtenberg, M.D. "A Case of Amaurotic Family Idiocy." *Ophthalmology*, Vol. 5, No. 3.

Samuel B., aged 21 months, of Jewish parents. The birth was normal and there was apparently nothing unusual with the child until the third or fourth month. At this time the mother noticed a change in the infant's actions. From the twelfth to the fifteenth month, convulsive attacks were frequent. These were severe, at times with opisthotonos. There is no history of syphilis nor is there any blood relationship between the parents. The child is now quite blind, the eyes are divergent, pupils small and do not react to light or very sluggishly. The head rolls about and cannot be held erect. The child cannot walk, talk, or sit up. The body is well nourished, the muscles are flaccid. The neck muscles are especially weak, and have been so from the first. The cranial measurements are below the average.

Ophthalmic examination shows an atrophic nerve head with excavation atrophy in both eyes. The retinal vessels are small and few in number. At the macula the characteristic changes are absent, there being no cen-

tral cherry red spot with a white area around it. The absence of the macula changes makes this case somewhat unusual. The other child of the family is quite normal. This is also out of the ordinary. The author reviews shortly the other cases reported. The etiology is unknown. All reported cases have belonged to the Jewish race. Treatment in this case as in the other cases has been of no benefit.

F. H. Verhoeff, A.M., M.D. "Amaurotic Family Idiocy: Histological Examination of a Case in which the Eyes were Removed Immediately after Death." *Archives of Ophthalmology,* Vol. 38, No. 2.

Although a number of pathological examinations have been made of the eyes in cases of amaurotic family idiocy, there still remains some doubt in regard to the histology of the retinal changes. In this case the eyes were removed fifteen minutes after death. The only demonstrable changes in the retina were confined to the ganglion cells which were markedly degenerated. It is evident that the ophthalmic picture of this disease is due to degeneration of the retinal ganglion cells about the fovea and to the contrast thereby produced, as originally maintained by Holden. The child was of Jewish parentage, 18 months old, family history negative. Development went on properly up to the third or fourth month, but at the eighth month the child was not considered bright mentally. Examination of the eyes revealed a grayish white patch with a brownish centre in the macula region of each eye. Optic atrophy was present, pupils were large and active. He was now fed by means of a stomach pump, and while his bodily condition improved, mentally he became progressively worse. He died at the age of three years of pneumonia. Two more children have since been born to the parents, the second of which shows the characteristic markings of the disease. On microscopic examination of the eyes, the pathological changes were found confined to the retina and optic nerve. With the exception of the ganglion cells, the retinæ were perfectly normal, but not a single normal ganglion cell was to be seen. The optic nerve entrance presented the asymmetrical appearance characteristic of myopia. There was complete degeneration of the temporal portion of the nerve, and degenerative changes throughout the nerve.

S. H. M.

Leslie Paton. "Optic Neuritis in Cerebral Tumours." *Transactions of the Ophthalmological Society of the United Kingdom,* 1908.

The substance of this paper was obtained from a careful and systematic inquiry into the records of the National Hospital, Queen Square. The two hundred and fifty-two cases investigated and upon which the sub-

stance of the paper is based were diagnosed as cerebral tumour. In forty-five of these cases the symptoms were not definite enough to allow of accurate localisation. Five cases simulated tumour of the brain but the symptoms were discovered post mortem to be due to other lesions. Of the remaining two hundred and two cases, with a definite localisation, one hundred and forty-eight were confirmed by operation or autopsy.

In an appended analytical table the writer shows that every case of temporo-sphenoidal tumour showed an optic neuritis of a comparatively high degree, 4.72D., as compared with the general average of all cases of tumour examined which was 4.34 D. In none of the temporo-sphenoidal cases was the degree of swelling mild, the disc was completely blurred in each case, and of the fourteen cases eight were of the hæmorrhagic type.

Forty-one cases of cerebellar tumour showed optic neuritis to be present in each case, the average degree of swelling being 4.41 D., almost as high an average as in the temporo-sphenoidal cases. Twelve of these cases showed hæmorrhages, and in five of these cases marked changes about the macula could be made out.

Of the thirteen cases of extra-cerebellar tumours, two showed no neuritis; the remainder, however, showed a high average of swelling, 5.03 D. Seven of the remaining cases manifested hæmorrhages, a macular fan being present in one case.

Frontal and parietal tumours have about the same percentage where optic neuritis is absent, 12.5 per cent. as contrasted with 14.28 per cent. In frontal tumours the average degree of swelling was determined as 4.27 D., in twelve cases hæmorrhages were present, and one case a macular fan. In parietal tumours where the neuritis was marked it only averaged 3.56 D. In twenty-eight of these cases hæmorrhages were seen only in six.

Of twenty-nine cases of sub-cortical tumour nearly 38 per cent. showed no evidence of optic neuritis; in the cases where a definite neuritis occurred the average swelling was 4.22 D. Hæmorrhages and macular changes seldom occurred.

In tumours of the optic thalamus and mid brain, neuritis is again fairly frequent, being absent in four cases out of sixteen. The average height of swelling recorded was 4.00 D. The occurrence of five cases with hæmorrhages would indicate the degree of swelling as being rather intense.

Tumours of the pons showed non-evidence of neuritis in 43 per cent. of the twenty-three cases examined, but when it did occur the degree of swelling was very intense, the average being 5.25 D., the majority of these being hæmorrhagic in nature.

In three cases of extra-basal tumour primary atrophy of the optic nerve was noted in two instances from direct pressure upon the chiasm; one a tumour of the pituitary body, the other a cyst of the floor of the third ventricle.

A review of the cases as a whole shows that there are two main localities in which we are likely to find tumours without optic neuritis, the deeper portions of the cerebral hemispheres and the pons. In tumours involving the cerebral cortex, liability to optic neuritis and the intensity of its development varies with the distance of the site of the tumour from the origins of the optic tract and nerves. One also remarks that every case of cerebellar tumour has optic neuritis.

F. T. T.

Prof. W. Uhthoff. "Zur Katarakt-Operation bei Diabetikern." *Bericht über die XXXV Versammlung der Ophthalmologischen Gesellschaft. Heidelberg,* 1908.

After describing the characteristic asbestos or silky sheen noted in the cortex of the lens in diabetics suffering with cataract, Professor Uhthoff states that 5 per cent. of his cataract patients have suffered with diabetes as a complication. His results in the extraction of the lens in 115 of such cases has caused him to have a great deal of encouragement in the outcome of the majority of cases and to repel the "noli me tangere" which a large number of ophthalmologists have applied to this condition of affairs in the past.

Of the 115 cases operated upon not one single case was lost from a resultant panophthalmitis. In two cases, however, a minimum of vision was obtained: in one case fingers at one meter, from post operative glaucoma following retinal hæmorrhages; in the second, light perception only, from recurrent vitreous hæmorrhages, complications which might ordinarily follow the extraction of a cataract when diabetes was not present. This last case had arteriosclerosis, diabetic gangrene of one leg, and albumen in the urine. One patient who was running a very good course five days after the operation died of diabetic coma. Certain cases made sufficient progress to enable them to return to their daily avocation.

The only observances which the author makes are to render the operation as aseptic in every detail as possible and to enforce the regime of diet for some time before the extraction is undertaken.

The complications occurring in these 115 cases are recorded as follows:—

Marked iritis (three times with hypopion), 6%; mild inflammatory appearances at the side of the iris, 5.4%; post operative glaucoma in

healing with retinal hæmorrhages, 0.9%; transient increase of tension, 1.8%; amotio choroideæ, 0.9%; hæmorrhages in the anterior chamber, 8.9%; death from diabetic coma, 0.9%; retarded reformation of the anterior chamber, 1.8%; retinal hæmorrhages, 4.5%; vitreous hæmorrhages, 1.8%; retinitis diabetica, 2.6%; retinitis albuminurica, 0.9%; choroidal changes in myopia, 1.8%.

The subsequent visual results in these 115 cases of diabetic cataract were as follows:—

Good vision, 1—1-3, 68%; useful vision, 1-4—1-10, 18%; defective vision, under 1-10, 14%; total blindness without perception of light, 0%.

F. T. T.

George S. Derby. "The Increasing Importance of Tuberculosis as a Cause of Ocular Disease. The Newer Methods of Diagnosis and the Treatment." *Transactions of the American Ophthalmological Society,* 1908.

The writer discusses the statistics of Horner, Groenouw, Hirschberg, Eyre and Stephenson, comparing them with the statement made by Helbron comparatively recently after an examination of 15,000 cases observed in the Berlin eye clinics, that one in every two hundred was tubercular. In 59 cases of chronic uveitis tested subcutaneously with tuberculin by Stock, 61% gave a positive reaction, while in 23 cases of scrofulous disease, 87% reacted. Hess reports over 50% of positive reactions to tuberculin in 100 cases of ocular disease. Stock's contribution on experimental innoculation in animals is a piece of work of the greatest importance in this respect.

The introduction of tuberculin has assisted us greatly in establishing new data, but owing to unfortunate accidents which occurred before its dangers were appreciated it has been taken up rather slowly. The subcutaneous test has been inconvenient when one has had to deal with a large number of patients, and the writer has based his observations in consequence mostly on the ophthalmo-reaction of Wolff-Eisner and Calmette, and to the cutaneous reaction of von Pirquet. In cases where the eye disease was binocular the writer employed von Pirquet's vaccination. One hundred and fifty cases have been examined of which 103 are reported in the contribution. Of these 83 reacted positively, 18 were negative and 2 were doubtful. The conjunctival test was performed 61 times, 45 positive, 14 negative, and 2 doubtful. The cutaneous test of von Pirquet was performed 58 times, 52 positive, 4 negative, and 2 doubtful. On 16 patients both tests were tried; on 14 both were positive; once the skin test was positive and the conjunctival negative and once

both were doubtful. Ninety-three cases are subdivided clinically as follows:—43 cases of phlyctenular disease, 38 reacted and 5 did not; 16 cases of relapsing sclero-keratitis, all positive; 16 cases of scleritis, 13 positive, 2 negative, 1 doubtful; 9 cases of anterior uveitis, all reacted positively. Of 3 cases of interstitial keratitis 2 were positive; the third case had previously reacted to tuberculin for pulmonary tuberculosis. In 4 cases with vitreous opacities and cloudiness in the lens, 1 was positive, 2 negative, and 1 doubtful. A case of tuberculosis of the conjunctiva gave positive result. The ophthalmo-tuberculin caused the writer some trouble and anxiety in more than one instance. In his hands the cutaneous test has been the more sensitive and no untoward results have followed its use.

In regard to treatment of tuberculous eye lesions Derby is most emphatic in recommending the strictest regimen regarding general hygiene. The patient should be placed in the best possible surroundings and encouraged to the utmost in assisting in his own recovery. The employment of tuberculin should be begun most carefully, starting with an initial dose of 1-100,000 mg. which may be gradually increased once a week until frequently several milligrammes in the author's opinion may be tolerated. Derby concludes his very carefully prepared and interesting contribution by remarking that his observations on the use of tuberculin in some 30 cases have not convinced him of its therapeutic value. Neither has it appeared to do harm when proper precautions have been observed. He is still using it and he expects to continue to do so. On the other hand, it has been evident that careful and scientific building up of the patient does good, and under it and appropriate local measures these patients get well, unless the disease has progressed too far before treatment has been instituted.

F. T. T.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

At the Annual Meeting of this Society the following officers were elected for the ensuing year:

President:—Dr. W. Grant Stewart.
Vice-President:—Dr. C. F. Martin.
Treasurer:—Dr. R. P. Campbell.
Secretary:—Dr. S. Hanford McKee.
Council:—Dr. W. F. Hamilton.

The fourteenth regular meeting of the Society was held Friday evening, April 15th, 1909, Dr. J. Alex. Hutchison, President, in the Chair.

SOME OBSERVATIONS ON THE MOVEMENT OF THE TONGUE.

A. T. Mussen, M.D., read this case report.

ULCERATIVE STOMATITIS.

H. B. Cushing, M.D., read this case report.

A. C. P. Howard, M.D. While having never experienced such an epidemic as Dr. Cushing has reported, some years ago I did have an opportunity of seeing two cases of Vincent's angina. Both these cases were in adults and were sent to the infectious wards from the medical side as cases of diphtheria. The most striking features about these patients were first the unusual degree of fetor, and secondly the marked degree of ulceration on the soft palate, with a very pronounced pseudo-membrane. In one case I remember it was thought to be luetic and had every appearance of it, but smear preparations showed the typical Vincent's fusiform bacilli and spirochætæ. Cultures on blood serum and blood agar were entirely negative. These two cases quite convinced me that there is a very definite form of ulcerative angina resembling somewhat the diphtheritic angina, and that possibly there is a definite etiological relationship between the lesion and the organisms found.

R. P. Campbell, M.D. As I have been working with spirochætes of late I have been very much interested in Dr. Cushing's remarks. One case I had was referred to me as being luetic on account of having an ulcer on the tonsil; at the same time there was no history of syphilis and on taking smears from the ulcer we obtained spirochætes in this symbiosis in great numbers. I had an opportunity of observing these in the living state, through the use of the dark stage, and the picture was most striking; there was simply a seething mass of spirochætes, like a mass of worms; the fusiform bacillus was also present. This illustrates how difficult it is to come to a satisfactory conclusion with regard to the etiological factor of Vincent's spirochæte. Here was a case which might have been set down as luetic which presented an enormous number of these spirochætes. The more patches in the mouth the more common it is to find the fusiform bacillus so that one hesitates to say which condition is present. At present the spirochætæ Vincenti and spirochætæ Duttoni as shown by Duval and Todd are the only spirochætes which have been grown on artificial media.

F. M. Fry, M.D. In regard to the etiology of this, a very important factor of course is the environment. This was strikingly illustrated when visiting different hospitals in Vienna. In the outdoor department

of the large hospitals, where poverty and filth prevail, one meets a very large number of cases, while in Berlin where less poverty exists and in Montreal it is rare. The therapeutic use of potassium chlorate is well known. One trouble in watching cases in the children's clinic at the Royal Victoria Hospital is that one seldom sees the results of the treatment, for they go away after one gives the patient potassium chlorate, and when the mother does bring the child back she generally says that it got well in a day or two. This condition is seen occasionally in the Foundling hospital and it occurs also in private practice. Dr. Gordon brought forward some cases of this nature a few years ago. I think the predisposing cause of this is a dirty condition of the mouth which acts as a very favourable environment to the bacillus.

J. Alex. Hutchison, M.D. It might be of some interest to you that a great many years ago I had a case of extreme noma, such as you occasionally see illustrated in textbooks; there was a large opening through the cheek from the surface to the interior of the mouth. This occurred in private practice in good hygienic surroundings. One of my seniors saw the case with me, and though I do not remember exactly we are almost certain to have given chloride of potash, as it was the custom to give this in those days. The child succumbed in a few days from the progressive gangrenous ulceration. This was before the days of the bacteriological cultures and we knew nothing about the cause.

LOCAL AND GAS ANÆSTHESIA: SKIN DISINFECTION.

E. W. Archibald, M.D., presented the paper, (see page 518).

G. H. Mathewson, M.D. It would seem that nitrous oxide gas given in the way Dr. Archibald describes would be of great use to us oculists in cases of glaucoma, and in unmanageable persons, who may require operation for the extraction of cataract, in that there is no post-anæsthetic vomiting.

R. P. Campbell, M.D. I have no experience with the Benzine-Iodine method at all, but German literature has been very full of this disinfection which has apparently given excellent results. As far as alcohol disinfection is concerned I have made some experiments, but they are far from complete. Ordinary alcohol has very little bactericidal power, even at 75 per cent. The other disinfectants I worked with are the alcoholic perchloride and the ordinary carbolic and various dilutions of it. It is astonishing after how long an exposure to these one can get a growth. For example with the B. proteus you may expose it to the action of 5 per cent. carbolic for a week and still get a growth.

J. Alex. Hutchison, M.D. Riordon wrote a paper some 12 or 15 years ago in which he strongly advocated the use of ordinary commercial

gasoline, and even to-day he practises the use of this almost to the exclusion of any other method of skin disinfection and I think he has very good results. Our own experience has varied in the Montreal General Hospital according to the fashion. We have been through the various methods as they were recognised by various experimental observers and this so-called dry method certainly has very much in its favour; as Dr. Archibald has said, it saves time and has the great advantage of not wetting the patients. Only this week I took advantage of this method in opening the abdomen in a delicate child, and I used it, not because I thought it was better than any other, but because I believed it could be done quickly without exposing the child to cold or the evaporation which always follows a moist dressing. Dr. Campbell has been rather modest in his remarks about skin disinfection: if I understand his observations correctly, we were practically sterile in the Montreal General Hospital in our methods of washing up. With reference to the use of gas, we used it a few years ago combining with ether and found it very satisfactory, but it was discontinued possibly on account of expense and the fact that we were getting more experienced anæsthetists all the time. With reference to local anæsthesia, I think its use will increase. One objection I have to its use in clinical work is that the teacher is limited in his remarks to the students on the case, as one does not feel justified in speaking too freely with the patient listening. Many local anæsthetics are on the market, indicating a demand,—Stovaine, Novocaine, etc. I practically never now pass a sound without a local anæsthetic. I use novocaine in all cases. Recently I did a supra-pubic cystotomy by the aid of this drug in a case which would not have permitted a general anæsthetic. The only pain felt was when the mucous membrane of the bladder was incised.

E. W. Archibald, M.D. With regard to Dr. Mathewson's query as to where this infection comes from, my conclusion is that with our present methods of sterilizing, rubber gloves, etc., it must come from the skin itself, chiefly the staphylococcus albus. We must expect the possibility of some bacteria being still present after we have finished cleaning up, and it seems to me that all methods are fairly equal in value: they all obtain a relative freedom from germs and the results are strictly in proportion to the care taken. Certainly in some cases this "dry" method gives excellent results. The gas anæsthesia is chiefly indicated in the toxic cases, the serious cases, cases that cannot stand much more. There is no doubt that ether anæsthesia is an intoxication, and if you are going to add one toxæmia to another one that is already present you increase the danger to the patient. Gas toxæmia is almost immediately eliminated from the lungs and adds nothing to that danger. With re-

gard to Dr. Riordon's use of gas-ether, it reminds me of Dr. Lawson Tait's decision that he never used carbolic acid but always turpentine. The gas-ether combination was not exactly what I meant. We use this at the Royal Victoria Hospital very frequently but that means a very short use of the gas. What I wished to call attention to was that the gas can be used for a long time. Dr. Nagle secured a very satisfactory anæsthesia by combining the two right along.

CEREBRAL AND EPIDURAL ABSCESSES OF OTITIC ORIGIN, WITH REPORT OF A CASE.

G. T. Ross, M.D., read the paper of the evening which appeared in the May number of this JOURNAL.

G. H. MATHEWSON, M.D. It is often difficult in the early stages to make a diagnosis of cerebral or cerebellar abscess because there may be no symptoms. If in the temporo-sphenoidal lobe one may get some disturbance in speech, whereas if the abscess be in the cerebellum you get disturbance of equilibrium, and from this you can sometimes make a diagnosis as to where the abscess is. It seems to me in Dr. Ross's own special case if he had taken off some more bone he might have got better results from the free drainage. As far as exposing the dura goes there is practically no danger at all.

E. W. ARCHIBALD, M.D. Dr. Ross's case is one upon which we must certainly congratulate him; the only point upon which might fall some words to be said concerns the question of the technique of operation. Once you have diagnosed these cases the question is whether the otologist or the general surgeon shall do the operation. In a broad minded way the conclusion you must come to is this, that if you are in the presence of an abscess which is diagnosible as such, that is which gives signs sufficient to make a diagnosis, then it is certain that that abscess is a fairly large one and occupies usually the temporal sphenoidal lobe or cerebellum. In cases where the abscess is of otitic origin, the infection has travelled up through the various channels underneath the grey matter in the temporo-sphenoidal lobe, and under such circumstances the otologist may explore and might find the pus: but I believe, without absolutely knowing, that he is tempted to make too small an opening and to put in too small a drain, and that he is less apt, unless he is very familiar with the possibilities, to get to the root of the condition. Under such circumstances I think that the case should be turned over to the general surgeon to make a thoroughly large free opening in the temporo-sphenoidal region or the cerebellar region. In such cases, where the otologist comes down immediately upon an abscess in the course of a mastoid operation, where he is led to go beyond the mastoid, through the

tegmen by finding the pathological condition which results in the abscess, I think the results would be better if the operation were done through the temporo-mesial route or by making a large osteoplastic flap. It is better to make the opening clear through the bone and leave the bone open. The surgeon is more inclined to do such a radical operation than the otologist. If there is one place where a large drain is necessary it is in these abscesses, for the tendency is for the abscess walls to fall in and be blocked, and under such circumstances the case should be turned over to the general surgeon unless the otologist is led most naturally to the abscess through the tegmen tympani, and only then can he succeed if he is prepared to do the thing very thoroughly.

G. T. Ross, M.D. I am sorry I have not the material by me to demonstrate the extent of the opening which was made in this case, but I can say that drainage here was perfect.

The fifteenth regular meeting of the Society was held May 17th, 1909, Dr. J. Alex. Hutchison, President, in the Chair.

LIVING CASE WITH PRIMARY BILATERAL ATROPHY OF THE MACULAR BUNDLE OF THE OPTIC NERVE, WITH SECONDARY CHANGES IN THE MACULAR AREA.

W. Gordon M. Byers, M.D. It will be remembered that the fibres which go to supply the macular region make up at the optic foramen a small round bundle which takes up exactly the centre of the optic nerve. These fibres, as they advance toward the globe, tend gradually to deviate to the temporal side of the nerve where, at the posterior pole of the eyeball, they form a definite triangular area. This axial bundle is particularly susceptible to the influence of certain poisons (tobacco and alcohol), and many cases of inflammation of its substance come before our notice; but it is rare to see a case in which the nerve fibres have gone on to atrophy and to the production of the white appearance seen in this man. Ophthalmoscopically one sees here on the temporal side of both optic discs the glistening white appearance pathognomonic of atrophy of the optic nerve. In addition to this one sees in the macular area on both sides, but especially the right, rarefaction and clumping of the pigment epithelium, signs of a localized retinitis which is undoubtedly consecutive to the atrophy of the nerve fibres supplying this region. The visual changes are characteristic of axial neuritis. The central sight is greatly reduced; and, while there is no narrowing of the fields, the usual central scotomata are present.

The man has been for years addicted to alcohol and tobacco in excess. As I said before, advanced cases like this are seldom met with; I have only

once before had the opportunity of seeing so marked an example of the late stages in axial neuritis. The patient was a man presented a few years ago at a meeting of the New England Ophthalmological Society in Boston.

D. A. Shirres, M.D. We are indebted to Dr. Byers for bringing this interesting case before us. We have had recently in the hospital three cases of tobacco amblyopia, but in none of these did we find visible changes in the optic nerve or the macular area, nothing of an atrophic condition of choked disc or neuritis. In this case of Dr. Byers, in the left eye one sees the triangular area very clear and it even can be seen by one who is not accustomed to the ophthalmoscope. I would like to ask what the prognosis is, and to ask if Dr. Byers has ever done anything in testing electrically for degeneration of the optic nerve.

Dr. Wilson. I would like to ask Dr. Byers if in his experience of this kind of case the kind of tobacco has anything to do with the cause of the amblyopia. Two cases of my own and three of a friend of mine occurred after the use of Canadian tobacco, and the impression given to me was that the Canadian tobacco was more especially liable to cause this condition than the ordinary Virginian or the English-cured tobaccos.

W. Gordon M. Byers, M.D. I am familiar with the reaction of degeneration in connection with the optic nerve, but it is, in any case, not applicable in axial neuritis, because a large number of the fibres are not implicated. In reply to Dr. Wilson, I do not think the kind of tobacco is so important as the quantity and the conditions under which it is taken.

IMPROVEMENT IN PROGRESSIVE MUSCULAR ATROPHY.

D. A. Shirres, M.D., and N. Viner, M.D.

Dr. Wilson. It occurred to me in reporting a case of that kind that it would be very interesting to know the strength of the current and the polarity used. In my practice I am inclined to believe that a weak current for a longer time is very much to be preferred to a strong current applied for a short time. I am of the opinion that a strong current does harm, and perhaps it is here that some physicians have a want of faith in this treatment.

D. A. Shirres, M.D. Dr. Wilson has brought up a point with which I thoroughly agree. In this treatment we used the negative pole over the motor point on the muscle. As Dr. Viner just mentioned, there were no electrical changes of degeneration either with the faradic or galvanic battery, hence we used the negative pole and used about 14 milliamperes and he got his treatment twice a week, and probably if he had got it four times a week he would have been better to-day.

N. Viner, M.D. I omitted to mention the fact that in addition the patient has had spasmodic twitchings at different times, which is characteristic of the condition, also the fibrillary twitchings. Ordinarily when we do not measure the number of milliamperes we give a minimum amount of current necessary to produce a contraction.

NEPHRITIS IN INFANTS.

F. M. Fry, M.D., read the paper of the evening.

W. F. Hamilton, M.D. I rise rather to commend the merits of this paper than to comment upon the matter it contains. This represents a great deal of work and careful study as well as much patience, and the conclusions which Dr. Fry has reached are practically the only conclusions that seem possible. There has been no special examination made of the bacteriology of these cases, and it has always occurred to me that many of these cases of nephritis or toxæmia may be bacterial rather than cases of chemical poison. I am interested to hear what Dr. Fry has to say on this point. Another practical point is with regard to the breast fed infants, how that they are on the down grade to the 14th day and all cases show albuminuria. Many of us who have children under our care are often at a loss to know why this loss of weight occurs, and it seems to me that Dr. Fry's observation must answer this question in many instances. I think we have here one of the best papers of the year and we have to thank Dr. Fry for bringing this study before us.

F. M. Fry, M.D. In reply to Dr. Hamilton, of course I had to consider the question of toxæmia, but I could not dwell on the findings in detail and the paper must be studied to bring out these points. However, I anticipated the question of toxæmia and bacterial infection. It is well known that in infants suffering from severe chronic intestinal catarrh one gets a nephritis. I was aware of this and at all my autopsies I examined the intestines and found them negative. The lungs, and the spleen especially, I examined macroscopically and in some cases microscopically, with the idea that if the condition were due to a toxæmia or bacteriæmia, changes would be apparent there, but there were no changes whatever in the spleen and the lungs were in most cases healthy. In all, too, the temperature charts showed a febrile condition and I concluded that I was certainly not dealing with a septic disease. I am indebted to Dr. Adami for suggestions as to the arrangements of the paper. In making the microscopical sections I quickly learned to prefer paraffin to celloidin. I am indebted to Dr. Keenan for kind assistance in preparing the sections.

SOME NOTES ON THE USE OF RADIUM IN MEDICINE.

G. E. Armstrong, M.D. This article appears in the June number of the Journal. In the discussion which followed, Professor Cox and Professor Eve, of the Science Faculty of McGill University, went fully into the composition of this substance, and ended up with the hope that the physicians in this country would get together and make it possible for this substance to be manufactured here and so place on the market this remedy within the reach of all, for it is from Colorado that we get the pitch blend from which this Radium is obtained and which is sold at such an exorbitant price in Paris.

G. P. Girdwood, M.D. All of us who are interested in X-Rays and Radio-therapeutics of various kinds are very much indebted to Dr. Armstrong for the paper he has brought before us and for the information he has given. It is an exceedingly interesting subject, this action of radium and the action of X-Rays. The two rays are somewhat identical though not quite so as proved by their use in various conditions. I have a case of rodent ulcer which I had six years ago healed by 17 treatments with X-Rays; it has now broken out again with an ulcer in the very centre of the cicatrix; I am treating this with radium and it is healing up. I also have a case which has been under treatment since 1905, a tubercular lupus. Though sometimes three or four months would elapse between treatments, still it has been kept in abeyance and has been getting gradually better. Lately I have been treating it with radium and it is improving much more rapidly. Two years ago was the first attempt I made at curing with radium and that was with a very weak specimen and not much benefit was obtained. In the British Medical Journal there is an article by Mackenzie Davidson, and he goes into the subject very thoroughly and completely corroborates the account Dr. Armstrong has given us to-night of the work at the Radium Institute in Paris. I think we are to be congratulated on having here to-night Professor Cox and Professor Eve, and I beg to move a vote of thanks to them for their kindness in coming here and giving us information.

A. E. Garrow, M.D. I was very much interested in the remarks made by Dr. Armstrong, and I rather got the impression that he was telling us what he saw rather than what he was inclined to believe. The statements made as to the cure of epitheliomas are, I think, on a par with the original statements made of the cure of superficial cancer by the X-Rays, and I think we must not, just at the very beginning of this form of treatment, fail to keep in mind that the cure of the superficial cancers is only one point of the probable presence of the disease at the time the treatment is begun, and until we have definite evidence that this particular method of treatment can follow up the lymphatic channels and en-

larged glands it seems to me rather a hazardous method of treatment. Especially is this so in epithelioma of the lip and above all of the tongue where, when early, eradication and removal of the gland gives the better results. There is no question that the radium treatment of nævi, warts and port wine stains, etc., has given exceptionally good results. I think, too, the best results so far as the treatment of malignant disease is concerned have been obtained in rodent ulcer where lymphatic infection is practically never seen, and in such cases radium is of great value, but to consider it in connexion with any superficial epithelioma, I think, until we know more about its penetrating powers in destroying lymphatic infection, it seems to be well to stop and think carefully over the knowledge we have of the material up to the present moment. Personally I was very much interested in the report Dr. Armstrong has brought back with him, but above all in respect to the very interesting information derived from the two professors who addressed us this evening.

Dr. Wilson. In seconding the vote of thanks proposed by Dr. Girdwood I wish to add my quota of appreciation and to express my satisfaction in the information which Dr. Armstrong has given us to-night, together with the talk Professor Eve and Professor Cox have given us on this most interesting substance.

G. E. Armstrong, M.D. During my visit to Paris I saw a great many interesting cases. There is no doubt about the results obtained in the angiomata. Some of these cases could probably be treated perhaps with equal success with liquid air and electricity, but some could not, particularly the pendulous and the pigmented nævi. In regard to cancer I do not think that any man with sound judgment would advise the radium treatment unless possibly in the case of the rodent ulcer. I do not know why the case of cancer of the tongue was so treated. I asked one of the doctors who had been there a month if he would treat a case of cancer with radium which could be removed by operation, and his reply was very much to the point: "Not on your life," and I think most of us would be inclined to take the same view. I remember Dr. Casey Wood telling me that he knew of a woman in Colorado who for years had made a very good living by the treatment of cancer with pitch blend; the results probably being derived from the small quantity of radium contained in this pitch blend. I wish to express my great appreciation and my thanks to Professor Cox and to Professor Eve for their kindly interest in coming here this evening, and by their presence and contribution to the discussion adding so much to the interest of the meeting.

The sixteenth regular meeting of the Society was held Friday evening, May 21st, 1909, Dr. J. Alex. Hutchison, President, in the Chair.

TWO LIVING CASES.

1. Infected cholesteatoma with mastoiditis.
2. Removal of large piece of steel from eyeball.

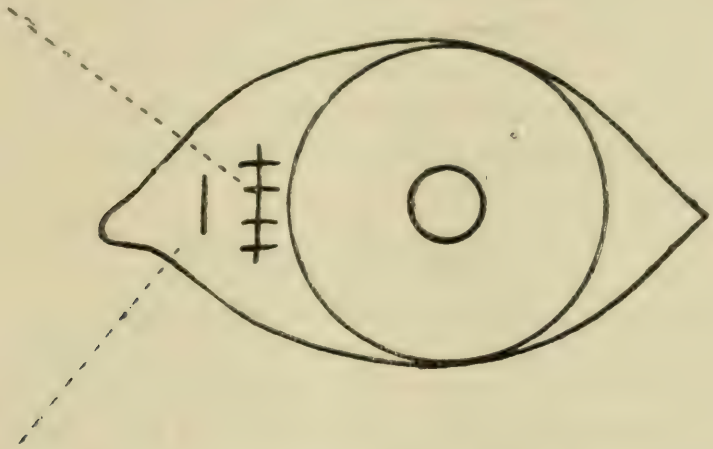
G. H. MATHEWSON, M.D. The first patient before you is eight years of age and came to my clinic at the Montreal General Hospital on the third of May, complaining of pain in the ear which had begun a week previously, and also of swelling behind the ear which had been present for one day. The father stated that the patient had had a discharge from the ear ever since early childhood, and that a year or two before coming to the clinic there had been a swelling behind the ear which had burst spontaneously, leaving a scar which can be well seen. The child was taken into the hospital and operated on the next day. On incising the skin we found that there was pus present beneath it and the gland was infected and apparently the source of this collection of pus. On opening the periosteum more pus was discovered, and on penetrating the bone a large cavity filled with pus was found; there was a cholesteatoma present. This condition of cholesteatoma is really nothing more nor less than a collection of cast-off epidermal cells from the skin which has entered the middle ear and there proliferated, forming this mass of exfoliated epithelial cells, and as succeeding layers are laid down the onion-like arrangement of the growth is produced. I took out this mass and soon found that there was a carious opening leading to the lateral sinus about which was a collection of pus, a peri-sinus abscess. I cleaned out the cavity, removed the whole of the upper part of the external wall of the posterior meatus and all of the mastoid cells, curetted the attic of the middle ear and the external auditory meatus, making the whole into one cavity. After this I sutured up the posterior wound and slit up the cartilaginous meatus, made a cross section and forced that back into the wound in the hope of causing it to become epidermised quickly. This operation was done fifteen days ago and the wound is practically healed and the cavity almost dry. The pathologist reported that the infecting organism was the streptococcus.

It is rather unusual to get so large a cholesteatoma in so young a child, and then again it is interesting to note in how serious a condition the child was and yet seemed to feel pretty well and was able to walk into the hospital.

The second case was that of a man about 29 years of age who came to the hospital on the 17th of April with a wound in his eyelid and eyeball. I saw the man within 1½ hours after the accident. On examination I found a wound towards the nasal side of the lower lid which had perforated it completely, and at a point 5 mm. from the cornea there was

a brown wound showing the choroid exposed, about 2 mm. long. On looking into the eyeball I could see a white mass occupying nearly all of the lower part of the fundus, extending to the macular region and showing many hæmorrhages. I used the large magnet (Sweet's magnet) and after one unsuccessful attempt succeeded in removing a large piece of steel 21 mm. long and 5 wide and 2 mm. thick, weighing six grains.

After having removed the piece of steel I dissected up the conjunctiva on both sides of the scleral wound and cutting off about 3 mm. of it on the side towards the cornea, drew the distal flap across by sutures so



that the line of conjunctival sutures was not over the scleral wound, but to the corneal side of the same.

Healing was perfect and he can count fingers at 10 feet and can see large objects. As a wage-earner he has two good-looking eyes, though one of course is impaired, and he does not have the discomfort of wearing an artificial eye which he would have had to do had this steel remained in or had this accident occurred before the use of the electromagnets, etc., such as we possess to-day. Had this steel been left in the eye an oxide would have been formed completely destroying the eye.

W. Gordon M. Byers, M.D. I should like to add my word of congratulation to Dr. Mathewson, particularly in connection with the favourable outcome of his second case. I am sure the conjunctival flap here favored healing very greatly. Cases of this kind mark the progress that has been made by ophthalmology in recent years. The X-Rays and the electric magnet have made it possible to save in most instances cases which a comparatively short time ago were irremediable.

J. Alex. Hutchison, M.D. I am sure we are all indebted to Dr. Mathewson for showing us these interesting cases. The general surgeon is not accustomed to see a mastoid scar looking so cleanly as in this case.

G. H. Mathewson, M.D. I might say that the mere fact of a man

having a cholesteatoma is not in itself a grave condition, but associated with outside influences may cause considerable trouble. For instance, I remember well a case I had of a man about 25 years old and he had such a condition for years, but going in swimming one day he developed a dizziness to such an extent that he could not stand, from infection of cholesteatoma which extended to the labyrinth. In one case of Dr. Politzer's almost the whole petrous bone became involved and yet the patient died from intercurrent disease after many years. With regard to the eye case, as Dr. Byers remarks, it is very interesting to note that since we have been able to take out these particles of steel by the magnet we are practically able to save all the eyeballs. We are not so fortunate with the sight, but it is a great thing to save the eye. A workman with two eyes that look normal even though the sight of one of them is not perfect can secure employment much more readily than one who is mutilated by the loss of one eyeball.

TREATMENT OF ECLAMPSIA.

H. M. Little, M.D., read the paper of the evening.

A. Lapthorn Smith, M.D. We are very much indebted to Dr. Little for this most interesting paper. The subject of eclampsia is always of interest and as discussed by Dr. Little is more so than usual. Dr. Little mentions a very interesting point that eclampsia is more frequent in winter than summer, and I can quite understand why this should be so for in this severe climate the want of oxygen is one of the things people suffer from most, and the less oxygen the more uric acid. Nitrogenous food stopping at uric acid instead of going on to urea has a great deal to do with the disease itself. I think it will be found that the atrophy of the liver is the result of this poison and not the cause of it. This poison seems to be one that has a powerful reflex action on the capillary circulation, especially of the kidneys and the brain, because the condition of the brain is exceedingly anæmic before the convulsion comes on. After the woman has been deprived of air by the convulsions the brain becomes exceedingly congested; but the spasmodic condition of the capillaries causes the convulsions. Dr. Little has said that very little result was obtained by preliminary treatment. I have had very great satisfaction personally from preliminary treatment, and a friend of mine in a large French maternity hospital told me that he had had several hundred cases in which treatment prevented convulsions, though they came in with a great quantity of albumin in the urine. I think that there is a great field for this preliminary treatment. We all know of course that it is the duty of every physician to make an examination of the urine of his pregnant patients at least twice a month during the last four

months as this is the means of saving very many from eclampsia, because we can at once put them on milk diet and alkalies, which I have found the best. I have tried the hot air baths with much success; in one case the urine was so filled with albumin that it became solid. During convulsions, next to Cæsarean section I consider morphia the best drug. In all my cases I begin with a hypodermic of a ½ gr. morphia. This will not affect the secretions as they are already stopped, and if you can relieve that spasm of the capillaries by morphia there is a chance of the blood getting into the kidneys and the urine getting out. Veratrum viride I used to use in every case until I came to the one of a woman who had almost no pulse when I first saw her, and I did not use it in that case. I am glad to hear of Dr. Little dropping out the chloral, which has killed more eclamptic women than even the accouchement forcé. Chloroform also I am glad to hear him say he gives as sparingly as possible. I remember hearing of women getting chloroform by relays of doctors for 12 hours steadily, when their hearts stopped. The sooner the woman is delivered the better, and that is the key-note of the whole situation; the only way I know of in which this can be done in a minute or two without hurting either the mother or child is by Cæsarean section performed by an expert abdominal surgeon.

A. G. Morphy, M.D. I would like to ask Dr. Little what method he would advocate in dilating a narrowed, rigid cervix in a 1-para where convulsions had set in before the onset of labour. I gather that the Pomeroy bag could not be used in such a case, and I would like to know if he would advocate the Harrison method with which I have had no experience. I have also a word to say about the examination of urine in cases of pregnancy. I believe, in fact I know, that there have occurred cases of convulsions with fatal termination in which the urine although examined a number of times showed no albumin. In fact I have in mind the case of a colleague of mine who had a patient with a great deal of swelling of the legs and who refused to go to bed and be treated; here the urine was examined a number of times and no albumin found. The woman fell down suddenly in a convulsion while standing up cooking the dinner. My colleague was called and after a great deal of difficulty managed to dilate the cervix and deliver the child, but the woman died three or four hours after delivery.

H. L. Reddy, M.D. I agree with Dr. Little in practically everything he has said; he has handled the question exceedingly well. With regard to the blood letting our French confrères are very fond of it, but personally if the discharge of blood has been very free at the delivery it practically is hardly needed or called for. With regard to treatment, I

think the great point is rapid delivery, as Dr. Little has said. If I had a case, which I did not so very long ago, in which the woman was brought in convulsions, my intention was to deliver her by *accouchement forcé*. In the case I mention, however, I found it was impossible as there was a long cervix and a hard os, so we did a Cæsarean section and she made an uninterrupted recovery. With regard to veratrum viride I have never been in favour of it, and I think the methods suggested by Dr. Little in the treatment are quite sufficient to bring a case to a successful termination if anything will. In these cases it is exceedingly important to get the arterial hypertonus. It used to be called arterial tension, and it is interesting to realise that really the arterial tension is practically no greater than in health, although the contraction of the vessels themselves is in a very different condition. With the use of the sphygmomanometer you can foretell an approaching convulsion by the rapid and high increase of the hypertonus of the vessel; when it goes above 150 you can be almost certain that you are going to have a convulsion. I feel that Dr. Little's treatment of the cases is all that anybody could suggest with the exception of the blood letting, which, unless there has been no blood lost, I do not feel is as advantageous as some represent it to be. It rather leaves the woman in a worse condition than she would otherwise be. And the means such as hot pack and salines help very much better the other treatment. As regards morphia and of course all other drugs I think they are objectionable. It is apt to injure the child for one thing, but if the woman is restless after the child is born it may be indicated.

H. M. Little, M.D. I should have impressed more strongly the fact that in dealing with this question I have considered only the cases of eclampsia; if I included the cases of toxæmia in which treatment was undertaken my figures would have been considerably higher. The cases reported are all cases in which convulsions had occurred.

I left out, with intent, all reference to the theory of the causation of eclampsia. Whatever the cause, we know that there is some toxin circulating in the blood causing it to coagulate more rapidly, and for this reason the blood loss at labor is usually very slight unless there is some mechanical hindrance to contraction of the vessels in the uterine wall; hence the reason for the blood letting.

In answer to Dr. Morphy I would say that in cases where the cervix is so tightly closed that it cannot be dilated by Harris's method, I think the patient should be sent to a hospital where she could be treated radically; when this is impossible treat her expectantly: you must consider the mother before the child. Personally I think vaginal section is

preferable to Cæsarean section. The simplest method of performing this operation is to draw down the closed cervix to the vulvar opening and then incise its anterior lip. When you reach the bladder insert two fingers between it and the uterus and by stretching the fingers apart you can separate them very easily; then continue the incision through the lower uterine segment practically up to the reflection of the peritoneum. In addition, you can, if you will, make a secondary incision in the posterior lip, but in the two cases I have had, it was only necessary to make the anterior incision. The advantage of this operation is that it is extra-peritoneal; that the single cut is very easy to draw together with catgut sutures and the operation from start to finish takes about 20 minutes.

With reference to Dr. Reddy's remarks on blood letting I would say that in these cases the primary blood loss was comparatively small. The administration of salines is, according to the French, absolutely contra-indicated. They say that the œdema at the time of labour is usually due to the retention in the body of the chlorides which are not excreted by the kidneys. Our experience has been that the normal salines are not contraindicated; but, acting on this theoretical objection, we have in a number of cases given a solution of lactose, isotonic with the blood, with exceptionally good diuretic results.

FURTHER INDICATIONS FOR CÆSAREAN SECTION.

A. Lapthorn Smith, M.D. (See page 516).

H. L. Reddy, M.D. I have had much pleasure this evening in listening to these papers. As to Cæsarean section, I believe Kelly, of Baltimore, takes twenty minutes to perform the operation, but I doubt if any one less skilled could attain this. As to its not becoming popular, Sänger makes the remark that "any physician practising midwifery and not able to perform Cæsarean section has not risen to the requirements of his time." I would be very far from recommending the general use of it for all cases; the death rate is 10 per cent. to 15 per cent. in large cities in ordinary cases of confinement in their own homes, but if every man performed Cæsarean section for every trifle it would probably be very much higher. It is only from 3 per cent. to 5 per cent. in the hands of careful operators. I certainly think it is a vastly superior operation to vaginal section. Certainly you have not got the peritoneum exposed in the same way with the latter operation, but now-a-days it is exposed by the majority of surgeons without fear, and I do not see why obstetricians should take this as an objection. I do not see any reason why this operation could not be done by an intelligent man in a private house, especially in the country; still I would be very slow to give up sending the patient to the hospital if it could be managed at all. It is a major

operation and never likely to become a very common one, but personally I would not hesitate to do it when it is needed. As to doing it over and over again on any woman I think that is an outrage. I consider it a duty to tie her tubes off. Of course this is out of the question with Roman Catholic patients. I think Cæsarean sections have been about 24 to 26, with four deaths: two were moribund on admittance to hospital.

J. Alex. Hutchison, M.D. I think that Dr. Reddy is very wise in stating that the operation is at all times a major one, and I cannot entirely agree with Dr. Smith that it can be done in two minutes and that there is no danger. I consider that every time the abdominal cavity is opened there is danger. In the hands of Dr. Smith and Dr. Reddy such an operation may be very simple, but what may be very easy to them may not be to a general practitioner, obstetrician or surgeon.

A. Lapthorn Smith, M.D. I am very grateful to those who have so generously discussed my paper to-night. I know that Dr. Little is under the influence of the European School, but I want to point out to him that the European School is following the American School and that American Gynæcology is leading the world to-day. For instance, the vaginal removal of pus tubes which originated in Europe is going out completely. Abdominal section is a very serious thing, but if there is one case more than any other where the ideal conditions exist for such section, it is in these cases, where the child must be removed from the mother as quickly as possible and with the smallest possible risk of injury to both. It must not be forgotten, however, that it requires an expert and quick operator if we would obtain a low or no death rate, and the services of such a one should be obtained whenever possible.

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ADDRESS IN SURGERY.

DELIVERED AT THE

FORTY-SECOND ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION.

BY

JAMES BELL, M.D.

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Cancer of the Prostate.

I desire to thank you, the President and the Committee of Arrangements of the Canadian Medical Association, for the great honour they have done me in extending me an invitation to deliver the address in Surgery before this meeting. When I received your very kind invitation, Mr. President, I accepted it with a deep sense of the responsibility which such acceptance entailed upon me,—a feeling which has not diminished as the time has approached for the fulfilment of my undertaking.

However, I shall not weary you with apologies or excuses, but will endeavour to direct your attention to a subject which has been brought very prominently before my attention and the attention of many other surgeons during the last few years—I refer to cancer of the prostate.

To one who has been engaged in surgical work for a quarter of a century or more, a retrospective glance at the achievements which have followed Lister's epoch-making discoveries is calculated to inspire the greatest optimism in the consideration of surgical questions, no matter how difficult they may seem to be. When one passes in review the difficult problems which have already been satisfactorily solved: the triumph over the infective micro-organisms by which all the cavities and organs of the body have been brought under the control of the surgeon, the growth of exact knowledge and scientific methods, the development of diagnostic skill and operative technique; one cannot but look hopefully and confidently for the solution of any surgical problem which presents

itself; and there are many and serious problems in surgery still unsolved. In this respect the attitude of surgeons has changed materially since the middle of the last century, when it was customary with prominent surgeons (like Alexander), to deplore the fact that there were no new fields to conquer, that the science and art of surgery had become a finished entity; but the sphere and scope of surgery have been so immensely enlarged in recent years that instead of this attitude, we, of the present day, feel that the surgical millennium is still far off.

The cancer problem is one of the greatest questions of our time. Much careful and painstaking work has been done and many earnest workers are engaged at the present time in endeavouring to discover the cause of cancer (or rather we should say, malignant disease, and include sarcoma), but although much good has been accomplished and much knowledge has been acquired which enables us to understand the disease better, the great secret of its origin remains hidden; and the net outcome of our knowledge has been the development of operative methods, the recognition of our limitations, and especially of the necessity for early diagnosis. Whether it be cancer of the tongue, the stomach, the breast, or any other organ, the universal rule has become recognized that early and wide and complete removal of the disease, while it is still local, is curative; that extension takes place early and insidiously by infiltration and lymphatic involvement, which must always be anticipated. Metastases through the blood-current are more of pathological interest than of practical importance to the surgeon. The really important fact which we must recognize is that we have not advanced in the treatment of cancer beyond the stage at which removal by operation is the sole remedy; and while we recognize the difficulties which must be encountered, and which necessarily vary with the organ or region involved, in effecting complete and thorough extirpation, we must also recognize the futility, or worse than futility, of any operation which falls short of complete removal.

I am aware that to this statement there may be exceptions as in cases of late recurrence, five, ten or fifteen years after operation, a condition which is not so rare as to be phenomenal; and indeed, in discussing the treatment of cancer of the prostate, I shall be obliged to consider partial operations but only as palliative and not as curative treatment. We may doubtless dare to hope that with fuller knowledge of the origin and growth of cancer, it may become possible to treat it successfully without operation or even to prevent it altogether, but that happy condition has not yet been attained. The history of tuberculosis affords ground for the belief, however, that this may be no idle dream.

In the operative treatment of cancer, we must practically disregard mutilation and loss of function in order to save or prolong life, and obviously some organs can be more easily spared than others. It is in the light of all these facts that I venture to direct your attention to cancer of the prostate gland.

I have chosen this subject for several reasons, among which are the following:

First:—Because there is a general, widespread and erroneous opinion in our profession, that cancer of the prostate is a very rare disease. This belief is based upon the statistics of cancer, derived from pathological records, in which the prostate is shown to be one of the organs least frequently the subject of cancer, and no doubt this error has survived because the prostate has not always been systematically examined at autopsies.

Second:—Because of the habit, which unfortunately prevails very generally, of making a diagnosis of hypertrophy of the prostate or "enlarged prostate" in the case of every man past middle life who seeks advice for disturbances of the urinary function. I believe I am safe in saying that medical practitioners generally consider that there is no difficulty in diagnosing senile prostatic hypertrophy and rarely look beyond the obvious facts of disturbed urination, with palpable enlargement of the prostate felt through the rectum, in elderly men; and I am quite positive that this is a fatal mistake. It should become the systematic habit of every practitioner to attempt a diagnosis between ordinary senile hypertrophy and other special causes of disturbed bladder function such as cancer, tuberculosis, stone, chronic inflammation, etc.

Third:—The great importance of the subject; on account of its frequent occurrence, the hopelessness of all treatment except surgical treatment in its very early history, and the distress and misery which it causes when radical treatment has become impossible. During the last fifteen or twenty years, much attention has been given by surgeons to the operative treatment of senile hypertrophy of the prostate, and a pretty general unanimity of opinion has been reached on this subject, but not so with cancer of the prostate. Indeed, operations upon the prostate for hypertrophy have only incidentally shown the incorrectness of statistics based upon post-mortem records, and have proved that, instead of being a very rare disease, it is a very common one; but beyond this no very great advance has been made in its treatment.

Frequency:—Young believes that cancer of the prostate occurs as often as once in seven cases of prostatic enlargement, in men past fifty. (Journal of the Medical Association, Vo. 46, 1906.) Thompson Walker,

in a study of 242 consecutive cases of prostatic enlargement, diagnosed cancer in 57, although he eliminated 17 in which there might have been a doubt of the diagnosis. (Lancet, Vol. 1; 1908.)

The records of the Royal Victoria Hospital in Montreal show that, since 1902, 142 cases of prostatic enlargement have been treated, of which 32 were diagnosed as cancer (one in four and a half). Of these, 88 were submitted to complete prostatectomy and the material removed was carefully examined with the result that 21 were demonstrated to be cancerous, 23.8 per cent. or a little more than one in four. It will be seen therefore that of all the patients who present themselves for the treatment of symptoms reasonably attributable to prostatic hypertrophy one in four or five is suffering from cancer: and indeed more careful and extended investigation will probably show that the proportion is even greater than this. I have no doubt the fact will surprise many physicians.

It is interesting to note that from the opening of the Hospital, in 1894, to the 1st June 1902, eighty-six cases of prostatic enlargement were treated, of which only one was diagnosed as cancer. This case was a large adeno-carcinoma of unmistakable character originating in the prostate. In the other eighty-five cases, six complete prostatectomies were performed, but no systematic examination of the ablated tissue was made. In the remaining eighty cases, many palliative operations were performed, but these were not of such a character as to admit of pathological diagnosis. This comparison shows how easy it is to overlook conditions which are unsuspected and how fallible statistics are except when obtained by most careful and accurate methods. The foregoing figures have been introduced in support of the statements made as to the frequency of the occurrence of cancer of the prostate, but no attempt has been made in this communication to present a full report of the statistics of the subject.

Varieties of Cancer:—Of the 21 cases examined in the Royal Victoria Hospital, four were from prostates which were small and very hard and showed in their minute structure a type of growth which resembled very closely scirrhus carcinoma of the breast, and five were from prostates which were markedly enlarged and showed a type of growth which resembled an adenocarcinoma. The remaining twelve were of intermediate character but more closely resembled the scirrhus type.

In many of the cases where the prostate was removed entire it could easily be seen that the new growth commenced well towards the centre of one of the lobes, but where only a small portion of the gland was removed, or where it came away piecemeal, this could not be determined.

Two types of malignant growth are therefore seen in these prostatic carcinomas; the one shows a cellular growth with cubical to columnar cells, usually arranged in such a manner as to suggest a poorly-formed gland acinus, while the other consists of small groups of small cubical cells scattered throughout a very firm and adult fibrous tissue stroma. The former type of growth is usually found where the gland is markedly increased in size, while the latter is often present where the prostate shows little if any increase in volume, or may even be apparently shrunken. Many of the carcinomata of the prostate show types of growth intermediate between these two. All these growths arise from the epithelial cells which line the ducts or acini of the prostate gland.

None of these prostatic carcinomata have shown an ulceration of the epithelium covering the gland, and thus the appearance of the gland as seen by the cystoscope does not indicate the nature of the enlargement.

Symptoms:—The symptoms produced by cancer of the prostate are in the main the same as those produced by hypertrophy, but they vary sufficiently on careful analysis to enable one to at least suspect in many cases that the disease is not one of ordinary hypertrophy. A full discussion of the symptoms would be out of place at this time, but the following are some of the main distinctive differences between the symptoms of simple hypertrophy and those of cancer:—difficulty in micturition, shown by delay in starting the stream and maintaining it until the bladder is evacuated, rather than retention:—often little or no residual urine, hence often no decomposition. Frequency:—perhaps not distinguishable from that of ordinary hypertrophy; pain greater than in hypertrophy and without apparent cause; sometimes felt at the point of the penis, the perineum, the sacral region, the urethra, and sometimes shooting down the thighs. Hæmaturia is observed only when the mucous membrane of the prostatic urethra or the bladder outlet has become involved. It is generally more or less constant and not excessive. It sometimes appears to be an early symptom on account of the insidious character of the growth in its early stages in which there are no symptoms whatever, but it is, in reality, always a late symptom. When the growth is large, residual urine is a more prominent sign and retention may occur from mechanical causes, but in the scirrhus type, at least, there is usually no projection of the prostate into the bladder. It may even cause serious difficulty in evacuation of the bowels, or actual obstruction without causing retention, as in a case recently under my observation.

In the small or shrunken prostate, which is by far the most common form, retention occurs less frequently. There can, of course, be no

uniform grouping of symptoms to distinguish cancer from hypertrophy and some of the most characteristic symptoms are often absent; and may be present in one case and not in another. Physical examination gives more definite information Dense, stony hardness felt from the rectum is perhaps the most important sign. This may involve the whole or only a part of the prostate. It is sometimes smooth and sometimes nodular. The lobes are often unequal in size, and in some cases where there are marked symptoms, the examiner will be surprised to find that there is very little palpable enlargement of the prostate.

Sometimes a small hard mass leads one to think that he has to deal with a stone or a tubercular nodule. Both of these conditions must be eliminated although they occur much less frequently than cancer.

In far advanced cases, the outline of the prostate is obscured by an infiltration of the capsule which gives the idea of an invasion of the bladder wall upwards. The bladder, however, is rarely invaded until very late, but the seminal vesicles and surrounding tissues are, and it is this extension which gives rise to the sign above noted.

The rectal mucous membrane may also be less freely movable in these late cases and enlarged cancerous glands may be found in the inguinal regions. Cystoscopic examination shows that the prostate does not project into the bladder as in ordinary hypertrophy, and Young describes the appearance of the mucous membrane as hard, drawn, and contracted looking.

When operation is undertaken it is found difficult or impossible to enucleate the mass, to separate the gland substance from the capsule, and it can only be torn away in fragments. (Doubtless many of the so-called "fibrous prostates," which have been described, were cancerous.) In early cases this may be noted at only one point in the mass. In the history of a case, rapid development of symptoms in a comparatively young man is very suggestive. In a word a man of 50-60 suffering from frequent micturition, much pain, comparatively little residual urine and whose prostate is very hard but not greatly enlarged, is probably the subject of cancer, and it is a very important question to decide whether enucleation,—the ordinary prostatectomy,—should be undertaken or a much more serious and extensive operation be provided for.

The following case may be taken as a type and one which illustrates also the hæmaturia which is observed in the later stages of the disease.

A strong rugged man, aet. 64, was in perfect health until December 1908, when he began to have some frequency of micturition by day and was obliged to get up once during the night. He had more or less burning at the neck of the bladder but no pain. Early in May 1909, he

began to pass bloody urine, which continued without change or interruption until his admission to hospital on the 23rd of June, 1909. The blood was intimately mixed with the urine but the amount was not large. He had a hard nodular prostate, and, on examination, five oz. of residual urine were withdrawn at one examination and at another no residual urine whatever was found. The cystoscope showed oozing of blood from all around the urethral opening, but no visible ulceration and no projection of the prostate into the bladder. Suprabubic operation on June 28th verified this observation and an attempt was made to enucleate the prostate. This I am now convinced was bad surgery, but it was difficult to know how to deal with the condition. It was exceedingly hard, and even with the aid of a perineal incision only a partial removal was effected. The patient made a good recovery, had no more bleeding, and was discharged July 27th with perfectly normal urinary function and no residual urine. It is, of course, unnecessary to add that this satisfactory condition cannot long continue, and one can only contemplate the future of such a case with a deeper feeling of sadness and despair than that which is evoked by incurable cancer in almost any other situation. In this case although the first symptom had been noticed less than six months before operation there can be no doubt but that the disease had been present for a long time before it gave rise to any signs.

The relation of cancer to senile hypertrophy of the prostate has not been sufficiently studied, but while there is no doubt but that cancer often attacks the already hypertrophied prostate, the comparatively early age at which it frequently occurs would seem to indicate that quite as frequently it occurs before there is any real hypertrophy. Whether hypertrophy predisposes to cancer or whether the occurrence of cancer in the already hypertrophied gland is not simply due to the more frequent incidence of cancer at the age at which hypertrophy occurs, are still unsettled questions.

The fact also that cancer of the prostate is usually, so far as we know, of slow growth in its early stages and has generally existed for some time before it produces symptoms, must also be taken into account. At any rate, cancer seldom occurs in the capsule after the removal of the hypertrophied gland. Careful examination of the prostate in cases in which cancer had not been suspected, has quite frequently discovered it in some part of the removed gland. Cachexia and failure of nutrition are rarely found until the disease is so far advanced that diagnosis is unmistakable. A peculiar feature which has been noted by nearly all observers is the tendency to metastases to the osseous system.

But the fact must not be overlooked that at the present time patholo-

gists are inclined to believe that metastasis to the bones is much more frequent in all forms of cancer than has heretofore been thought to be the case. My own experience is not in accord with that of other observers on this point, as in none of my cases was there any sign of bone involvement when the diagnosis was made; and in one case only am I aware of this form of metastasis recurring after operation, but it is true that no attempts have been made to follow up the later histories of my cases.

I will describe here, briefly, a case which came under my care nearly three years ago, as it not only illustrates the results of partial enucleation but is also the case in which bony metastases occurred two years after operation.

A man, 71 years of age, had suffered for two years with some frequency to which at the end of one year was added urgency and difficulty, and later on pain: and still later on, retention. The pain increased. There was no hæmaturia; his health became poor and he lost about 15 lbs. in weight. On admission to hospital, he had a distended bladder; the urine was of a low specific gravity, turbid; and contained albumen but very little pus. The prostate was removed by suprapubic incision and enucleation. The tissue removed weighed 17 grammes and was definitely cancerous. The patient made an uninterrupted recovery, had perfect urinary function and normal urine and became so well that the diagnosis was questioned. At the end of about two years, however, he showed evidences of metastases in the sacrum, gradually failed and died two and a half years after operation.

Prognosis:—When the disease has advanced to such a degree as to admit of clinical diagnosis, the outlook is bad. This, of course, is precisely what is to be said of cancer in almost any organ. In one such case, (above mentioned) the patient, aet. 71, where a fairly satisfactory enucleation was possible, lived two and a half years with perfect urinary function to the end and with good health for about two years. In some cases in which cancer has been found in the prostate after operation, but where it had not been suspected clinically, the patient has enjoyed good health for several years; but when the disease has progressed to a degree at which satisfactory enucleation is impossible, the prognosis is bad in every way, and while incomplete operation will often restore the urinary function for a time, it will also probably in most cases hasten the growth and spread of the disease and shorten life.

Treatment:—As may be inferred from what has already been said, an ordinary prostatectomy (enucleation) will often give satisfactory results for a long time in the early cases. Some surgeons recommend

this method of treatment and report cases as cured by it, but it is impossible to make a sufficiently wide removal of a cancerous prostate by enucleation where the diagnosis can be made before operation. The subcapsular dissection recommended by Proust and Albarran would appear to be theoretically a little more promising, but in more advanced cases the history of operative treatment has been far from encouraging. Billroth is credited with having performed the first operation for the radical removal of a cancerous prostate in 1867. Many operators since that time have devised and carried out operations with this object in view, some by the suprapubic route and others by the perineal route. Large portions of the bladder have been removed by some operators, and even the whole bladder has been removed and the ureters transplanted, but the results have not been such as to encourage a continuance of any of these methods.

In 1905 (Johns Hopkins Bulletin), Young of Baltimore devised the operation which bears his name and which stands to-day as the only radical procedure which commends itself to surgeons.

Two lessons have been learned, however, namely, first: that it is impossible to follow up extensive involvement of cancerous glands where they exist, and second, that closure of the bladder wound is possible after very large portions have been removed by the perineal route. Young's operation, which consists in exposing the prostate in the perineum, cutting the membranous urethra across and removing the bladder neck, prostate, seminal vesicles and ampullæ of the vasa deferentia, and reuniting the stump of the urethra to the upper angle of the bladder incision which is closed up to this point, has been very successful in his hands, but has not been extensively employed by other surgeons up to the present time. In fact, the radical removal of the cancerous prostate has not received the attention from surgeons which its importance entitles it to. It must, however, be admitted that the operation is difficult and not without danger, although Young had only one operative death in his first six cases and the after results were very satisfactory. In a direct communication Dr. Young writes me that one of his cases reports himself entirely well at the end of about four years. Even this operation can of course only be expected to be curative in the early cases. There are also more advanced cases in which even complete extirpation of the bladder and either bringing the ureters out upon the loin, as recommended by Watson, or transplanting them into the bowel with all its risks and disadvantages, would seem to be preferable to a period more or less prolonged of hopeless suffering and a miserable lingering death.

I have in mind at this moment several cases of strong useful men in middle life doomed beyond all hope, and dying by inches in constant pain and distress from cancer of the prostate.

Surely any treatment or any operation which can hold out any hope would be gratefully accepted by patients in such an unfortunate position; and the endeavour to treat the more desperate cases by operation would only be in accord with the general practice of surgeons in the treatment of cancer of other organs as already pointed out. We do not hesitate to extirpate the tongue, the stomach, the breast, the limbs or any organ, even where we feel that there is great doubt as to the possibility of getting completely beyond the disease, especially its extensions into the lymphatic system; and subsequent history very often proves that we have not completely eradicated it.

Finally, in the most advanced cases where no operation is possible which holds out any hope of cure, palliative treatment is called for. It will be seen that in the early cases, especially in those operated upon before a clinical diagnosis has been possible, that the ordinary enucleation gives very satisfactory results for a time, but in the great majority of cases it can only be palliative.

It has not been my purpose in this communication to give a detailed history and description of cancer of the prostate or of its treatment in the past. I have not attempted to array facts or to marshal figures in favor of one line of treatment or another. I have had nothing new to offer as to its pathology, symptomatology or diagnosis. I have only attempted, and I hope not entirely without success, to direct your attention to a painful, distressing and fatal disease which, occurring so frequently as it does, does not seem to have received sufficient attention from the general practitioner who first comes into contact with it, nor from the surgeon who is finally called upon to treat it.

I would strongly urge that the same thorough, conscientious investigation be given to patients with disturbances of the urinary function as is given to disturbances of function of other organs, in order that early diagnosis may be made; and that surgeons should give to this disease the benefit of their most serious consideration, their skill and surgical resource, to the end that satisfactory operative treatment may be developed and made available for those unfortunate sufferers while the disease is still local and circumscribable, and that more satisfactory palliative treatment may be evolved for the inoperable cases.

CYST OF THE WALL OF THE CAROTID ARTERY.

BY

A. FREEDMAN, M.D.

(From the Pathological Laboratory, Royal Victoria Hospital, Montreal).

G.B., aged sixty, was admitted to the Royal Victoria Hospital on March 29th, 1909, suffering from a frank acute lobar pneumonia. The patient died two days after admission.

The autopsy, which was performed three and a half hours after death, revealed the following pathological conditions: acute left sided lobar pneumonia, generalized arteriosclerosis, arteriosclerosis of coronaries and peripheral vessels, fatty change of the intima of the pulmonary artery, fatty and calcareous degeneration of the aorta, fibrosis of myocardium, calcification of papillary muscles, chronic interstitial nephritis and chronic mitral endocarditis.

The generalized arteriosclerosis was of moderate grade, and affected not alone the aorta, but also the smaller vessels of the muscular type. In the aorta, this sclerosis varied from small and scattered points of superficial fatty change of the intima, to the more extensive fatty softening of the deep intima and inner media. Here and there, too, small plaques of calcification were present in the arch, and in the lower abdominal portion of the aorta.

At the origin of the common carotids the aorta was fairly healthy, and, save for a few longitudinal and superficial fatty streaks in the intima, the common carotids showed little macroscopic change. This condition, however, was altered close to the bifurcation of the common carotids, where the vessel wall showed severe atheromatous change, with endarteritic thickening, which extended into the internal and external carotids. In this situation, calcareous masses could be felt in the atheromatous plaques and in places the vessel lumen was distinctly narrowed by the overgrowth of intimal tissue over these plaques.

In the right common carotid at a distance of 2½ cm. from its origin, and lying in a portion of the artery which showed few degenerative changes, was a small cyst with gelatinous contents occupying the middle zone of the arterial coat. The cyst was oval in shape, with its long axis running parallel to the direction of the vessel. The cyst lay on the anterior side of the artery, and from the inner surface of the vessel it was seen to project above the general level of the intima. Similarly when viewed from without, there was a definite bulging of the arterial coat in the adventitia.

The intima covering the cyst was quite smooth and free from atheromatous or endarteritic change. Likewise, there was no evidence

of disease or of a neighboring inflammatory process on the external surface of the artery. The adventitia covering the cyst was quite pale and similar to the tissues in the neighborhood.

On opening the cyst, it was found to contain a gelatinous semi-solid substance, looking not unlike the colloid material of the thyroid. This material was of such consistency that it remained in situ after the cyst was bisected.

The inner and outer walls of the cystic cavity were formed by the arterial coats and were of about equal thickness. There was no evidence of a thinning of the vessel coats, and the combined thickness of the inner and outer walls of the cyst was about equal to that of the wall of the carotid on either side of the cyst.

Microscopical:—Stained sections of the carotid showed the cyst to be in about the centre of the media, and to have its walls composed of the tissues of the artery. Sections through the middle of the cyst showed the main portion to be unilocular, with narrow slit-like cysts lying at either extremity of the main cyst in the arterial coat. In other places several small circular, oval and slit-like cysts lay at the extremity of the main vesicle, and some of these were apparently related to the main cyst.

The inner wall of the main cyst was composed of either an elastic lamina of the vessel, or a layer of circularly disposed muscle fibres, which lay between the elastic fibres normally. Here and there there were small tags of elastic and muscular tissue jutting into the cavity. There was no evidence of a fibrous capsule enveloping the cyst and all evidence of inflammation, either acute or chronic, was wanting. Nowhere was a cellular infiltration evident, and fibrous tissue was not to be seen, save in the slight quantity in which it is present normally in the arterial wall. There was about an equal amount of the arterial coat lying to the inner side of the cyst as there was to the outer.

The contents of the cyst were for the most part homogeneous, and took a pale blue stain with hæmotoxyln. In places, however, the contents, were finely granular, and appeared to be mixed with some debris of degenerating cells lying at the margin of the cyst.

In comparing a series of sections, it was plainly evident that the early beginning of the cyst was in the neighborhood of the elastic laminæ. Slit-like openings were found to lie between the elastic strands and the neighboring muscle bundles. With the increase in the size of the cyst, the muscle fibres became infiltrated with the homogeneous secretion and various stages of degeneration of the muscle fibres could be seen. On the other hand but little change was evident in the elastic fibres. In some sections a number of these cystic dilatations could be seen lying

close to each other, with lamellæ of elastic fibres and some muscle cells separating them. Occasionally in the main cyst narrow partitions could be seen jutting into the cavity and dividing it into small cysts.

The intima of the carotid artery away from the cystic dilatation was a little thickened, but on the whole appeared quite loose. As the intima passed over the cyst cavity its substance became more compact, and the tissue showed the effects of pressure from the cyst so that the intima occupied a narrower margin. The media on both sides of the cyst also showed some effects of pressure in having the muscular lamellæ somewhat compressed, but in counting the number of elastic laminæ, it was found that there was but one, or at the most two, less in the cystic wall than were present in the arterial coat on either side of the lesion.

Further than the pressure atrophy or dissolution of the muscle fibres between two parallel elastic lamellæ close to a cyst, there was no evidence of tissue necrosis.

The adventitia appeared quite normal, and was not thickened or fibrosed. There was no evidence in the vasa vasorum of the presence of thrombi or occlusion of their lumina.

To sum up the principal features in the foregoing case, we find a small cyst lying in the media of the carotid artery, along with a number of smaller cystic dilatations lying in the same plane, at either extremity of the main cavity. Each of these cysts is filled with a homogeneous gelatinous material, and their presence in the vessel wall has exerted pressure on the surrounding tissues. The smallest cysts, which may be taken as the early beginnings of the condition, are seen to lie close to the elastic laminæ and arise without evidence of primary necrosis or of inflammation. As the cysts enlarge, there is a pressure necrosis of the muscle cells in the immediate vicinity, but the elastic fibres resist the strain and remain intact without showing evidence of degenerative changes.

The intima remains healthy, save for compression of its tissue over the cyst, and the sum-total of the arterial coats lying to the inner and outer sides of the cystic cavities is almost equal to the thickness of the normal vessel wall.

From the microscopic sections, it appears that the various cysts were associated with each other and probably communicated through the lymph spaces. The contents of the different cysts were similar in character, save that the more extensive ones contained some debris of degenerated muscle fibres about them.

In the absence of a capsule or any evidence of fibrosis, and also in the nature of the cyst contents, it is evident that the condition was not the

result of any parasitic disease. It is also apparent from the absence of a primary necrosis in any of the tissues of the vessel wall that the cystic dilatations do not represent focal necroses of the arterial wall. This conclusion is also borne out by the absence of inflammation about the lesion, and the healthy state of the vasa vasorum of the part.

On the other hand, the tissues about the cyst presented the effects of pressure, originating within the cyst, demonstrating the presence of an active secretion into the cavity. Moreover the contents of the cyst had the appearance of a coagulated, albuminous fluid, such as might arise from a serous fluid. Evidence is also at hand that the secretion in the smaller cysts began before the tissue elements of the part showed any signs of destruction. These early cysts developed in the immediate neighborhood of the elastic fibrils leading to slit-like dilatations and separated the muscle bundles from the main elastic lamellæ. These situations are those of the normal lymphatic spaces of the arterial wall.

We are thus led to conclude that the most probable explanation for these dilatations is that there has been some obstruction and stasis in the local lymphatic channels, which have led to a retention of the fluid and dilatation of the normal lymphatic channels. It is more than probable that the multiple cysts which were present, were along the same route, or emptied into the same lymphatic channel which was obstructed. The condition is thus to be regarded as a lymphangiectasis in the media.

We have not been able to find any report of a similar condition. in the literature.

AN ANALYSIS OF TWO HUNDRED AUTOPSIES UPON INFANTS.

BY

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The series consists of 204 cases of which only 37 per cent are over two months of age. The age incidence by months is as follows: 1st, 57; 2nd, 71; 3rd, 31; 4th, 16; 5th, 3; 6th, 6; 7-12th, 11; over 1 year 4. It will thus be seen that 78 per cent of these cases are in the first 3 months of life. Four, only, are over 1 year, and the oldest is 2 years. The children were nearly all born at the Montreal Maternity or the Women's Hospital, Montreal, and innutrition is a prominent feature throughout. In the majority of cases the cause of death can be found. The commonest lesions are broncho-pneumonia and gastro-intestinal

disease. There are, nevertheless, 45 cases in which the only diagnosis made is marasmus or inanition. In these the diagnosis is practically to be made from the high degree of poor nutrition, while, internally, there is no change observable, unless it be the presence of prominent Peyer's patches in the intestines and mesenteric glands. Whether this is a natural enlargement or not is doubtful. It may be that these appear to be prominent only because of the relative absence of fat in the tissues.

Diseases of the Respiratory Tract:—The upper air passages in a child of one or two months can suffer a considerable degree of inflammation without corresponding post-mortem change commensurate with this disturbance. A noticeable tracheitis, for example, is visible in only 16 cases, and bronchitis has been observed in 31 cases, tracheitis generally co-existing with bronchitis. Aspiration of vomitus has been observed in only three cases.

With regard to the lungs, pneumonia is, of course, far the commonest lesion and it is generally bilateral, 69 cases being found in the series: the majority of these are lobular, the lesion being numerous broncho-pneumonic areas, generally in the posterior parts of the lungs; some of these are generally fused in the lowest parts. It is not easy to say how many of these depend upon hypostasis for their origin, as probably many of them do. It happens that only two of them are noted to have this anatomical distribution and only one is septic. Lobar pneumonia is shown in only 17 cases. From the fact of 14 being bilateral, there is every likelihood that many of these individuals have had scattered areas of consolidation, which have fused, so that not all of these 17 are true lobar pneumonia. In the majority of pneumonic cases the pleura is not seen to be involved. If so, it must be merely in a microscopic sense. However, it may be stated that in 6 cases actual dry pleurisy was present and in 6 pleurisy with effusion. The effusion is nearly always small in amount, and we do not recall having seen a case of serious pressure on the lung. There were three cases of hæmorrhagic pleurisy. Empyema was observed once, in a case in which the pneumonia was septic. We could not tell certainly whether the lung or the pleural infection was primary, but all evidence was in favor of the lung, there being two small abscesses therein.

Old pleural adhesions were found very definitely on the right side, posteriorly, in an infant of 260 days old. In the vicinity of these old adhesions there was recent consolidation of the lung, but the adhesions dated back to a much earlier period.

Collapse of a part of a lung is fairly frequent, but it rarely affects

more than a small fraction of the total bulk of the organ. It is noted in 6 cases, though slight degrees can be found in a fairly large percentage.

Emphysema was noted in 9 cases, and interstitial emphysema, which sometimes becomes very noticeable, was seen in 3. Abscesses of the lungs were found 4 times, always secondary to pneumonia. Pulmonary apoplexy was noted but twice, and tuberculosis of the lungs but once, in a case of generalized tuberculosis, evidently of thoracic origin, which was noted in a child of 102 days old. This case will be referred to again.

Gastro-Intestinal Diseases:—The œsophagus, as in an adult, is comparatively immune, there being but two cases of œsophagitis. A remarkable dilatation of the œsophagus was found in a case of 76 days, a male, in whom the lower two-thirds of the tube were decidedly dilated, there being no evidence of stenosis in any part. The greatest width was 3 cm. above the cardia, where the œsophagus measured 3 cm. in circumference, which is about twice its usual size. There was no other abnormality, save for three accessory spleens.

Inflammation of the stomach was found in 40 cases, it being in conjunction with disease lower down in 31 of these. In one case multiple small, dark brown ulcers were found, the largest of them being 3 mm. diameter. The dark color was evidently due to pigmentation, and microscopic examination indicated that these were true inflammatory ulcers: the case was one of acute entero-colitis. Dilatation of the stomach was found 4 times, though only once did it appear to be accompanied by actual gastritis. Entero-colitis is the commonest condition found in the intestinal tract, the combination happening in 35 cases, only one of which was ulcerated. The small intestine alone was inflamed in 22 cases, one of which was hæmorrhagic. The colon alone was found affected in 13 cases, only one of which was ulcerated.

Proctitis was not carefully noted, but it is practically always present in diarrhœic conditions of the colon. Agonal intussusception was noted twice, and a congenital left sided indirect hernia was found in one case, a male of 14 days old.

Infective Conditions:—The most important series of infections are probably those which have reference to the umbilicus. The umbilical cord was found in a suppurative condition once, and the hypogastric vessels were found to be the site of arteritis or phlebitis in 5; only two of these led to peritonitis, although peritonitis was found altogether four times.

Peritonitis:—The above mentioned case was 27 days old, a female in

which a sinus could be found underneath the umbilical scab. The hypogastric veins were the seat of a septic thrombo-phlebitis, and the peritoneum was the seat of a streptococcus infection. The second streptococcus infection of the peritoneum could not be traced at all. A third case was a boy of 49 days, in whom there was an umbilical scab, with considerable thickening of the peritoneum at this point, but no abscess. On following down the thickening, however, along the hypogastric vessels, the tissues around these were found necrotic, so that evidently the infection had come along these vessels. Bacterial examination showed mixed cocci and bacilli. A fourth case of peritonitis was a boy of 25 days, and here again the cause could not be determined. There was an acute gastritis and an intense adenitis of the mesenteric glands, but this latter was perhaps secondary.

Erysipelas was found in but one case, in which it affected the face.

Septicæmia occurred once in a boy of 15 months, who presented an acute bronchitis, but no other evidence of an origin for the disease. A second case was a boy of nine months who was ricketty and had otitis, pneumonia, cholecystitis and multiple abscesses of one kidney. The lung here contained pneumococci and the ear streptococci.

A case, which was diagnosed as sapræmia, occurred in a girl of 9 days, who had cellulitis, abscess of the scalp with operation but incomplete drainage of the infected parts. Abscess of the scalp occurred in 2 cases, —the above mentioned and another, a female of 19 days, in whom birth injury had evidently occurred. The parietal bone was depressed, and there was streptococcus cellulitis of the scalp. A third case of cellulitis of the scalp was found in a child of 168 days, in whom ulcers of the scalp existed with great thickening and chronic œdema of the tissues of the scalp, which gave staphylococcus.

A case of retro-pharyngeal abscess was found in a girl of twenty days, in which the abscess extended from behind the left naso-pharynx down to the bifurcation of the trachea. There was no hint of its origin in larynx, trachea or œsophagus, but it gave rise to a widespread cellulitis of the neck.

An acute hæmorrhagic pancreatitis was met with in one case, a boy of 68 days, in whom there was an acute duodenitis and jejunitis. The pancreas throughout its head was dark red, swollen, hæmorrhagic, and the lobules were indistinguishable. A case of suppurative mastitis was also found in a boy of 32 days. There was really an abscess of the breast, and the child had died from cerebral softening, secondary to otitis media.

Before leaving peritoneal affections, it is worth noting that in a female of 41 days, who died of pneumonia, there was found distinct adhesion of the great omentum to the abdominal wall in the region of the umbilicus, pointing, evidently, to an infection of the umbilicus, which had been overcome and localized. It is worthy of note in passing that distinct splenic adhesions were found twice, in children of five and ten months, respectively. In the elder of these children, the spleen capsule was quite perceptibly thickened at one part. In the matter of splenic adhesions, it is always a debatable point as to whether the inflammation began in the peritoneum or spleen. My own belief is generally in favor of the spleen, and it seems to me that the existence of adhesions in so young infants is rather in favor of that view.

Liver:—It is notoriously difficult to tell with the naked eye much about the changes in the liver. Five times we have seen what seems to be an excess of fat, and four times the organ has seemed to be the seat of cloudy swelling; but this is a very small number of cases, considering how much inflammatory disease is found in the series. The anomaly known as Liebermeister's groove was found four times, and abnormal lobation was seen once.

Gall-bladder:—Dilatation was observed in a boy of 23 days: the bile, instead of being amber colored, was clear and viscid, with a dark green sediment. The surface was inflamed. Considering that there was otitis, pleuritis, pneumonia and ileitis, the case ought perhaps to be considered one of septicæmia. Cholecystitis was found 3 times, including the above case. In one other case cholecystitis occurred as part of a general septicæmia, and in the third case no cause could be found for it. In a female infant of 17 days, cholelithiasis was found with a deposit taking the form of bile sand.

Spleen:—Enlargement of the spleen, depending, doubtless, upon the infective disease, was found in 16 cases, in 3 of which the spleen was pulpy, as happens in the adult. In addition to the adhesions mentioned above while speaking of the peritoneum, fibrinous adhesion from the spleen to the wall was found in children of ten months, two months, fifteen months and one month, in all of which cases it seemed to be the result of preceding disease in the spleen.

Adrenals:—Hæmorrhagic areas in the adrenals were noted in 3 cases, in one of which there was a very marked anæmia of all the organs. An abnormal degree of pigmentation, by which the medulla appeared quite black, was observed once.

Kidneys:—The commonest change seen in the kidneys is the existence of fine yellow particles, which are found to be urates, in the medulla

and the pelvis of the kidney: sometimes these were found in the ureters and bladder. They were observed in 52 cases, more than 25 per cent, and practically nothing is known of any significance they have with regard to the kidney. In one case, an infant of 2 months, the deposit was found of pinhead size, and in another, a female of 44 days, a calculus, roughly oval, with a diameter of 4mm., and of hard consistence, was found; the latter was whitish and did not show a uratic character. Dilatation of the pelvis of the kidney was noted in only one case, a male of 34 days, in which there was an apparent stenosis of the ureter just at its commencement. Abscess of the kidney was found in septicæmia.

The question of nephritis in the infantile kidney is very difficult because it always appears as if the cortex were much swollen. I do not think that a naked eye diagnosis of cloudy swelling of the kidney is of any value, and I cannot give any better reason for this statement than the universality of the finding. An acute nephritis, in my own experience, is oftenest indicated by an inequality in size of the kidney, the larger one being bloody and soft, almost fluctuant, while the other, smaller and firmer, is of the usual color: 9 times has the diagnosis of acute nephritis been made, and in a certain number of these, as before mentioned, the disease was unilateral. A beautiful congenital cystic kidney was found in a girl of 53 days. The kidney measured 4½ x 3 x 2 cm., and consisted of a mass of cysts, of which the largest was 2 cm. diameter. The other kidney was normal.

Bladder:—Acute cystitis was observed thrice; the uratic deposit, spoken of above, twice; submucosal hæmorrhages of the bladder were observed once; hydrocele of the cord was found in a male of 14 days. Failure of descent of the testes was noted thrice, and phimosis 22 times. The frequency of this last is significant when it is added that this phimosis was not taken on the evidence of the eye, but manually determined.

Genitalia:—Of the female genitalia, the only abnormality noticed was a well-marked cystic dilatation of the ovary, full of clear fluid, measuring 1½ x 1 x ½ cm., in a baby of 22 days.

Bones:—Rickets was found thrice. Osteitis of the skull was found once, and once the parietal bone was thinned from the pressure of a hæmatoma.

Anomalies:—In a series like this, the anomalies form a very interesting part, and we are able to make comparison between this series and the complete observations of a series of adult autopsies.

Transpositions:—Two cases of practically complete situs inversus were found: in one, a male of 49 days, who died of pneumonia, there was a transposition of all the viscera, save the gall-bladder, combined with

atresia of the pulmonary artery, hypoplasia of the pulmonic ventricle and a deficient auricular septum: this case was reported in the Journal of Anatomy and Physiology, XL, 1905. The second case was complete and was combined with patent foramen ovale and interventricular septum. In a third case there was a very interesting series of cardiac anomalies, which will be mentioned under their proper heading, and a complete transposition of the liver and gall-bladder. The case died from abscess of the lung and pleurisy, following pneumonia. A fourth case showed a dextro-position of the rectum.

Anomalies of the Circulatory System:—The most common anomaly was patency of the foramen ovale: this was found in 83 cases—that is, 40 per cent. In the majority of cases the patency is oblique and the opening is only a valvular one: this valvular opening becomes completely closed in many cases, because in our adult cases the anomaly was found in 14.8 per cent. An actual deficiency of the septum was found but twice, while deficiency of the interventricular septum was also observed twice. Patency of the ductus arteriosus was observed 19 times, but I feel sure that this is an overstatement, because in children of this age the duct is always patent to a fine probe; the fibrinous-like material found in the duct leads one to suppose that it would not admit the passage of blood. I remember to have seen but one case of definitely patent ductus in this series, and in that case the ductus was much dilated to a degree which might almost be called aneurysmal. In the case mentioned above of multiple anomalies, a ductus arteriosus was absent. The case of hypoplasia of the pulmonic ventricle above alluded to was so extreme that for practical purposes the heart had no pulmonic ventricle and was a three-chambered one. An accessory renal artery was observed once and an abnormal course of the iliac vein once. The case of multiple cardiac anomalies, above referred to, was a male of 74 days. Besides deficiency of the two septa and absence of the ductus arteriosus, the inferior vena cava entered the left auricle, the pulmonary artery was stenosed and came from the left ventricle.

Anomalies of the Lungs:—Anomalous lobulation of the lung was noted in 16 cases—that is, 7 per cent. Our adult series of 1,000 shows the anomaly in 8 per cent.

Anomalies of Abdominal Organs:—The œsophagus was congenitally dilated in one case. Liebermeister's grooves of the liver were found 4 times, 2 per cent, which contrasts with 7.3 per cent of our adult series: abnormal lobulation of the liver was noted once. Accessory spleens were found in 15 cases, 7 per cent, which is rather less than the 9.5 per cent of our adult series. Absence of the spleen

was noted in the case of multiple anomalies of the heart. Meckel's diverticulum was observed in the bowel but once, whereas our adult series shows this in 2 per cent.

With regard to anomalies of the mesentery, these have been observed but twice. In one case, a male, the cæcum was held in the upper right quadrant of the abdomen and could not be made to descend below the navel. The second case was the case of multiple anomalies mentioned above. It had a meso-colon of about 12 cm. in length on an average. It had no gastro-colic omentum, but had a gastro-pancreatic one. Congenital cystic kidney occurred once. An apparent congenital narrowing of the ureter, with slight nephrosis, was found in a boy of 31 days. An infantile hernia, combined with hydrocele of the cord, was found once.

Undescended testes were found thrice. In one case an abnormal, square cartilage came off from the 4th left costal cartilage, and one case of spina bifida in the lumbar region was found in a girl of 17 days, who had hydrocephalus.

Specific Infections:—Thrush was observed only once, and was situated in the mouth. Syphilis was found in but one instance, and even there there is some doubt as to the diagnosis. It was a male of 41 days, with ulceration of the roof of the mouth, extending to the palate bone underneath and softening it. This, added to the appearance of the face, was all the evidence upon which to go, and the case was, therefore, very doubtful.

Tuberculosis:—The only case of tuberculosis found in this series was a male of 102 days old, in whom the tuberculosis was decidedly generalized. There was tuberculosis of the thoracic and abdominal glands, as well as the cervical. There was miliary tuberculosis of lungs, thymus, spleen, liver and kidneys. It is hard to say whether the thoracic or the abdominal glands had been first affected, because they were all very large and caseous. The thoracic lesions were perhaps the most extensive, and, as far as we could learn, the case seemed to be one of infection by the air passages. The intestines were free from evident disease.

Circulatory System:—Probably the commonest departure from the normal that is noted in the heart is the occurrence of hæmatomata on the valves. These were observed on the mitral valve twelve times and on the tricuspid five times. In one case these seemed to have become calcified, in a girl of 43 days. Among the cardiac anomalies, there was a distinct stenosis of the pulmonary artery, observed in one case: the stenosis gave to the pulmonary artery a maximum circumference of 4 mm. Dilatation of the heart is a matter of considerable difficulty of determination, but the auricles were observed to be dilated twice, both

being cases of entero-colitis; the right auricle showed the most marked dilatation. Twice in cases of broncho-pneumonia the ventricles, especially the right, showed dilatation. In one case, a male of one month, an area of dark bluish color on the outside of the right ventricle indicated a hæmorrhage into the ventricular wall, 1 cm. in diameter. The case was one of entero-colitis and the cause was not determined. For some reason one does not ordinarily find clot in the heart chambers, but in one case of marasmus the right ventricle was found to contain a firm, grey clot, 2 cm. long and 1cm. in diameter, of a sausage shape: it almost filled the ventricle and ran into the pulmonary artery. The effect of this clot was perhaps nullified by the existence of a wide-open foramen ovale and patent ductus arteriosus. Thromboses are, also, not numerous, but in one case of nephritis, in a child of 13 days, the aorta had a decidedly firm clot, of a grey color, adherent to its walls, and in one other case of entero-colitis the renal veins and arteries were found thrombosed, but no change was present in the kidneys, save a marked congestion.

Head and Brain:—It is notoriously difficult to obtain much evidence of cerebral changes in infants. The brain is so soft that a satisfactory removal is a matter of much difficulty, but one can, in a general way, make out the condition of the meninges and the brain tissue. Among vascular changes in the cerebral circulation, œdema of the pia was noted three times. Decided congestion of the meningeal vessels three other times. The lateral sinuses were found thrombosed once, the thrombus being adherent to the sinus in a case in which no otitis media was present Intra-cranial hæmorrhage was observed thrice. In one case, a female of 25 days, a clot adherent to the upper surface of the tentorium cerebelli was found. In another case, a male of 24 days, a somewhat old clot was found over the anterior surface of the left frontal lobe. The clot lay under the pia, and the blood had stained yellow the brain tissue. A similar blood clot was found in the left lateral ventricle. In the third case, a male of 56 days, there was a vertical sub-pial hæmorrhage of the right side, with evidences of blood in the right lateral ventricle, the tissue bordering upon it being the seat of encephalitis. I am inclined to think that these were all birth injuries. The slow absorption of blood may perhaps be due to the poor degree of nutrition found in these children. Of changes in the cerebral vessels, thrombosis from suppurative otitis media was found once in a male of 32 days: on the same side was found a basal vessel thrombosed and a distinct cerebral softening in the region of the left lenticular nucleus. A muco-purulent meningitis was found in a girl of 47 days, in whom the meninges gave a pure culture of pneumococcus: there was no middle ear or mastoid disease, nor any lung disease. There

had been a muco-purulent discharge from the nostrils, but no other septic site was found in the body. Pachymeningitis chronica was observed in a case of 15 months, in which there was extreme thickening of the dura up to six or seven mm. as a maximum thickness. Inside the dura, and adherent to it, was a thick membrane of fibrin, which could be stripped off, leaving the pia unchanged: with this there was extreme hydrocephalus. The immediate cause of death was broncho-pneumonia. Hydrocephalus was found in two other cases: one of them, a girl of 17 days, showed the transverse diameter of the head nearly 20 cm.; 100 cc. of fluid were found in the skull. There was also in this case a spina bifida. In a third case, a girl of 6 months, dying of pneumonia, a moderate internal hydrocephalus was found.

Eye and Ear:—Ophthalmia of a purulent nature was found twice, in one of which it was determined to be gonorrhœal. In one case there was a keratitis, of which the cause was not discovered. Suppurative otitis media was found in 21 cases, about 10 per cent, and this is probably an understatement of the truth. Mastoiditis was found but once.

Organs of the Neck:—The thymus gland shows constant variations in size, and the only point worthy of note was that it was once the seat of military tuberculosis. Goitre was observed twice, both times in males: in one of these the thyroid was moderate, in the other of large size. Pharyngitis and laryngitis were observed but four times, and in three cases there was marked œdema of the glottis. The strangest condition found in the organs of the neck was that, in a boy of 35 days, the right sterno-mastoid muscle showed a transition in its lower third into a distinct white mass of fibrosis. The firmness and consistence of this fibrous tissue leads one to suppose that it must have been repair of an intra-uterine lesion.

TREATMENT OF PROSTATIC OBSTRUCTION.

BY

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For some time past a well trained band of scientific clinicians in France, Austria, Germany, England and America have been giving special attention to the genito-urinary tract, with a single eye to the remedy of pathological conditions. They have added to our knowledge of anatomy, physiology and pathology, delved into the ætiology, closely observed and differentiated symptoms, watched the course and tabulated the results of medical and surgical treatment,—trying all things, believing no tradition. Such are the men who have revolutionized

modern practice in this specialty—Guyon, Albarran, Motz, von Frisch, Zuckerkandl, Englisch, Nitze, Israel, Wossidlo, Kollmann, Thompson, Fenwick, Young and a host of others, doing equally good work. So large is this subject, however, and so little explored as yet, that the whole field of medicine offers no better opportunity for scientific research. Today we place before you, however inadequately, the treatment of prostatic obstruction.

Anatomy:—This flattened, roundish gland envelops the urethra for a distance of 1¼ inches from the bladder above to the triangular ligament below, in such a manner that almost all its parenchyma is behind. Through it the urethra runs almost perpendicularly; the lower end, however, bends slightly forward from the region of the sinus pocularis. In front of the urethra is non-striped muscle, elastic and fibrous tissue, with a little striped muscle and a few gland tubules. Increasing on the sides to predomination behind the urethra, is tubular parenchyma, which discharges its external secretion through the mouths of some twenty or thirty ducts, opening for the most part on the back and side walls of the urethra. Acini and ducts are enclosed in compartments whose partitions are of non-striped muscle, with some fibrous and elastic tissue intermixed. These stroma elements radiate from similar tissue about the urethra to similar tissue at the periphery.

The prostate is bounded above by the bladder and vesico-prostatic space; below by the triangular ligament and fascia of Denonvilliers, which separates it from the recto-urethralis muscle; behind by this same fascia, which separates it from the rectum; in front by the space of Retzius; and on the sides by the levatores ani. Its attachments are to the bladder above, for a radius of about one centimeter around its outlet; below to the triangular ligament, for a slightly less radius; and in front to the pubes by the pubo-prostatic ligaments. There are no lines of cleavage between the prostate and these attachments, but Wallace says that everywhere else the gland can be easily separated from its surrounding fascia.

There are two roots to this gland (if one may speak of them as such), which carry the main blood and lymph vessels, the nerves and, higher up, the ureters also,—all enveloped in loose, connective tissue. They spring from each side of the pelvis behind, to merge on the upper part of the prostate and base of the bladder. The blood vessels are from the inferior vesical and middle hæmorrhoidal; the nerves from the hypo-gastric and pelvic plexuses; while the lymph channels run to the iliac, hypo-gastric and sacral groups of glands. There are smaller roots carrying the dorsal vein of the penis and the obturator veins to the plexus of Santorini.

The space of Retzius is the areolar, tissue-filled cavity between the bladder above, the prostate and prostatic ligaments behind and the pubes in front and on the sides.

The plexus of Santorini is composed of many large valvulated veins filling this space and the vesico-prostatic space.

The vesico-prostatic space surrounds the vesico-prostatic sphincter and is deepest behind, where it lodges in part the veins of Santorini, the vesiculæ seminales and the ampullæ of the vasa differentia, which traverse it from above down. It is bounded behind by the fascia of Denonvilliers.

The fascia of Denonvilliers is a perpendicular, many-ply-thick, sheet of fascia, between the rectum and recto-urethralis muscle behind and the prostate and vesico-prostatic space in front. It is attached below to the triangular ligament; at its sides to the fascia of the levatores ani, which it joins perpendicularly and at right angles, and above by the pouch of Douglas. On the sides it becomes looser areolar tissue, enclosing some of the veins of the plexus of Santorini in front, while above it fills the vesico-prostatic space; here also becoming quite loose, connective tissue it enmeshes the vesiculæ seminales, the ampullæ of the vasa deferentia and the plexus of Santorini. Above the pouch of Douglas it is continuous in front with the sub-peritoneal coat of the bladder: and behind with that of the rectum.

The vasa deferentia and the ducts of the vesiculæ seminales enter the highest part of the prostate behind and join to become the ejaculatory ducts. These run not more than a quarter of an inch apart from the base of the gland to their exits on the lips of the sinus pocularis, lie not deeper than a quarter of an inch below the back surface of the prostate, and maintain these relations, even under pathological conditions. They are surrounded by their own tough, muscular sheath and are thus often uninjured in Freyer's operation of supra-pubic enucleation.

The internal sphincter of the urethra, identical with the vesico-prostatic attachment, is made up of unstriped muscle, elastic and fibrous tissue from both bladder wall and prostate. In its normal condition and undilated, one could cut it transversely for a depth of at least five millimeters from the lumen, without danger of opening the vesico-prostatic space.

The external sphincter is, in part, the above described triangular ligament attachment of the prostate. In addition to the same constituent tissues as the internal sphincter, it contains a large amount of voluntary muscle, especially in front.

A capsule to the normal gland does not exist. The periphery of the gland proper is made up of stroma, intimately interwoven with the

stroma running between the acini and with that surrounding the urethra. A line of cleavage, superficial to this, and between it and the fascia of Denonvilliers behind, and the loose, connective tissue which carries the plexus of Santorini, does exist, but here the likeness to a capsule ceases, as this line of cleavage cannot be followed across the attachments of the prostate to the bladder, pubes or triangular ligament.

The verumontanum is an elevation on the back wall of the urethra, three-quarters of the way down from the bladder orifice to the apex of the gland. It envelops the sinus pocularis, the homologue of the uterus and vagina of the female.

The nerves form numerous ganglia about the prostate.

For clinical purposes only, the parenchyma is arbitrarily divided into lateral lobes which lie on each side of the urethra; the sub-montanal, behind and below the verumontanum; the pre-spermatic, between the spermatic duct and the urethra in the mid-line, the sub-cervical (or, if one may suggest it as more appropriate, "the sub-trigonal"), at the rear edge of the sphincter, and the pre-urethral.

Physiology:—So far as known, the function of the prostate is entirely sexual. Its development depends upon development of the testes. It is normally rudimentary before puberty and in crypt-orchids and eunuchs, throughout life. In adults the normal gland atrophies after castration. John Hunter observed that it was very small in moles while hibernating, but attained large dimensions in the rutting season. Serrallach and Pares of Barcelona, last year, after a great deal of work, concluded that removal of the prostate gland caused atrophy of the testes, but their experiments and deductions are far from convincing. Whether it has an internal secretion and even the properties of its external secretion, are as yet unestablished. It is generally accepted, however, that the latter dilutes the thick secretion of the testes and aids in vitalizing the spermatozoa. Normally it is an alkiline fluid of milky appearance, containing microscopically lecithin bodies and small and large granular cells. Some animals,—for example guinea pigs,—lack the prostate gland. It does not seem to be an essential sexual organ.

Bell of Dublin has proved that the internal sphincter alone is sufficient for the control of urine in the dog. Geraghty and myself have confirmed this.

The external sphincter is normally fully competent to control urination in human beings, when both internal and prostatic sphincters have been rendered useless.

The prostatic urethra, surrounded as it is for the most part by involuntary muscles, in addition to its function as an auxiliary sphincter,

probably empties the prostatic urethra of the last drops at urination, by peristaltic action.

Pathology:—The causes of prostatic obstruction fall under the following heads:

1. Hypertrophy.
2. Stricture of the vesico-prostatic or internal sphincter.
3. Tuberculous and cancerous strictures of the prostatic urethra.
4. Sphincter spasm.

1. *Prostatic Hypertrophy* is by far the most common cause of urinary obstruction after middle life. Of its ætiology nothing is known, nor probably will be known until the origin of tumours generally is made clear. Inflammation does not cause it. In fact, although inflammation is present in most prostates, in hypertrophy tissue itself it is lacking. Cultures cannot be obtained from it nor polymorphonuclears be found in it. Hypertrophy, moreover, is a misnomer,—the condition is frankly adenomatous.

In fully 90 per cent of cases these adenomata are made up almost entirely of parenchyma-like elements, encapsulated by the prostate itself and easily enucleated. In one to two per cent of cases pseudo-stroma elements predominate, and in these, because of the intimate interweaving of the new growth with the prostatic stroma, no shelling out of the neoplasm is possible. Between these two extremes are adenomata with admixtures in all proportions of false glandular and inter-glandular tissues. The more the parenchyma-like elements predominate, the more easily is it enucleated. Although all tissues of these neoplasms resemble normal prostatic tissues, the abnormal can be made out by the expert microscopist in over 90 per cent of cases. Microscopically these are soft and elastic; on section rise above the level of the surrounding compressed prostatic tissue, from which they are clearly defined, and are succulent and spongy, containing some dilated alveoli, which are visible to the naked eye.

An adenoma is seldom solitary, but multiple adenomata, not often confined to one lobe, usually coalesce to form a single growth, which more or less completely surrounds the urethra. As it increases in size the neoplasm stretches upward into the bladder, usually through the internal sphincter and on the back and sides of the urethra, carrying the bladder exit forward or sideways, to the extent of perhaps an inch or more: and thus the first portion of the urethra, instead of being perpendicular, lies nearly horizontal, with the adenoma on top, like a valve to prevent evacuation. The tumour may protude into the base of the bladder from

the subtrigonal lobe, on the posterior edge of the internal sphincter, and, if pedunculated, overhang the bladder exit. Yet again it may form a cone about the urethra, and, protruding into the bladder, carry the outlet with it, on or near its apex.

Adenoma often causes pressure atrophy of the musculature of the posterior urethra.

The bladder muscles, some bundles of which normally radiate from the urethral opening, while others run concentrically about it, in hypertrophy have a place of departure outside the intruding neoplasm. To overcome obstruction the bladder first hypertrophies, then, to accommodate the intruding neoplasm and residual urine, it dilates and may even reach the level of the umbilicus. Its muscles, at first closer set and stouter, to meet their increased work, later become separated, and alveoli form between the criss-crossing of their fasciculæ. The mucous membrane on the floor of these depressions may at last become applied even to the peritoneal coat itself. This is the "trabeculated bladder," so-called. If too great force is used to evacuate the bladder, in its weakened condition, it gives way first at the weakest spots,—the obliterated urachus or about the ureteric openings, forming the so-called "diverticulated bladder." On vesical over-distention follows refusal of the bladder to receive more urine through the ureters, and then supervenes dilation of the ureters themselves (above their bladder insertions) and of the renal pelvis to accommodate this intermittently unaccepted supply. Finally there is pressure atrophy of the renal parenchyma.

The blood of the plexus of Santorini, in quadrupeds, runs horizontally to the heart; in man the heart has to lift this column of blood vertically and without the aid of any additional valves; thus these veins are often over-distended, their valves become incompetent, varicosities and phleboliths form and unless cardiac reserve force is drawn on, venous congestion of the prostate supervenes. Small wonder is it that the additional weight of urine in an over-distended bladder, bearing on the veins in the vesico-prostatic space often causes enough extra back pressure in venous capillaries to rupture them in the prostate itself, the prostatic urethra, or neck of the bladder and cause hæmaturia.

So far we have described the "quiet bladders,"—giving perhaps the single symptom of increased urination.

Cystitis is easily engrafted on this pathological condition by the introduction of even slightly virulent bacteria. During cystitis these invade the ureteric orifices, ulcerate, erode and open them up. Infection ascends to the renal pelvis and kidney. Pyonephrosis succeeds hydronephrosis.

If the invader is a urealytic micro-organism, there follows ammoniacal, putrid urine, in which are triple phosphates. Secondary calculi may form in any part of the urinary tract where stagnation occurs.

If infection was coincident with the start of a prostatic hypertrophy, the bladder contracts and hypertrophies, but never dilates.

Prostatitis, prostatic abscess, vesiculitis or epididymitis may complicate the condition.

2. *Stricture of the Vesico-Prostatic Sphincter.*—The frequency of inflammation on three sides of this muscle from prostatitis, posterior urethritis and "coli-cystitis," the readiness with which stricture forms in other parts of the urethra, on far less provocation and the number of cases one sees with symptoms of prostatic obstruction, before the age when hypertrophy occurs, impel one to believe that true stricture of the bladder outlet, before middle life, is far from rare. It may, moreover, overlap prostatic hypertrophy. Albarran called attention to this condition in its more advanced stages in 1904, when he suggested that it might explain why the removal by operation of some apparently unencapsulated hypertrophies would not always relieve obstructive symptoms. Prostatitis, originating as it does most frequently in the posterior urethra, practically always involves the prespermatic lobe. There is always periacinar infiltration, with pus cells and leucocytes, and fibrosis of the musculature of the stroma is a frequent sequel.

This supplanting of muscular by fibrous tissue, when it takes place at the vesico-prostatic orifice, results in ordinary stricture, except that it may contain glandular tissue in its meshes. It occurs mostly on the back side of the urethra and takes the form of the so-called fibrous median bar. This is usually accompanied by cystitis and posterior urethritis, which has persisted from the beginning or recurred from auto-infection from the prostate; but it is impossible for an obstructive prostatitis to be present without cystitis, posterior urethritis, or even much involvement of the prostate beyond the median lobe. When cystitis is present, it is usually caused by streptococcus, or colon bacillus, but other micro-organisms may get a foothold, arrriving either by blood stream, lymph stream, or per catheter.

Ascending infection to the kidneys is not common, but seminal vesiculitis and epididymitis are frequent complications.

Stone may form in the bladder if there is an accompanying alkaline cystitis.

3. *Tuberculous and Cancerous Stricture of the Prostatic Urethra.*—Tuberculosis of this region is practically always secondary to tuberculosis of the kidney or epididymis, and if fibrous tissue tends to form

about the focus, it is apt to involve and stricture the prostatic urethra.

Cancer of the prostate apparently begins as the adenoid form, but with time tends to become on the one hand medullary, or, on the other, scirrhus. Usually the adenoid type persists in the greatest part of this malignant growth, for the whole course of the disease. It is characteristic of, and peculiar to cancer in this gland, that it is present as more or less discrete tubules in which the epithelium tends to confine itself without invading the supporting stroma. If one relies on general pathological appearances of malignant growths elsewhere, and is not cognizant of this peculiarity, the tumour is apt to be labelled benign. In 10 per cent. of specimens of hypertrophy at the Hôpital Neckar, Albarran and Motz found cancer, and Young and Geraghty got about the same percentage from the Johns Hopkins specimens. In such cases the obstructive conditions will be identical with those of hypertrophy.

While cancer usually begins in the periphery of the gland, and its extension is by the lymphatics into the vesico-prostatic space, to involve the ampullæ and the vesiculæ seminales, it may also involve the prostatic urethra, causing very dense stricture. Nerve involvement, by the cancer growth or pericancerous inflammation, causes the characteristic pain of cancer.

There is sometimes engrafted on a chronic posterior urethritis, an acute œdema, from instrumentation, excessive coitus, etc., which swells the prostatic urethra to closure. This transitory condition may call once or twice for catheterization, and will not be further referred to. Omitted also is the paralytic condition of the bladder, resultant on spinal cord lesion, in which there is retention, trabeculation and dilatation of the viscus, of the internal sphincter and of the prostatic urethra.

4. *Spasm.*—"Prostatismus" is a term used by Casper to cover a functional nervous condition whose symptoms are violent and uncontrollable strangury, with little or no residual urine, a normal bladder capacity, and, presumably, clear urine and no evidences of prostatitis. Almost always, however, repeated prostatic massage will produce an opening of the occluded prostatic ducts and allow the escape into the urethra of characteristic inflammatory products of prostatitis, while the endoscope may reveal an inflamed and enlarged verumontanum. This condition of prostatitis without signs, is indeed rare, and still rarer must be the class of cases in which no lesion can be found and can safely be labelled as "functional neurotic."

Symptoms.—Though this gland is sexual in function, the essential symptoms of its derangement are urinary, not sexual. They are caused by mechanical obstruction to micturition. These symptoms are:

1. Increased frequency of micturition. (Pollakiuria).
2. Difficulty in starting and in maintaining the stream.
3. Small calibre and weak force of projection of the stream.
4. Dribbling after apparent completion of urination.

Complications give the following symptoms:

1. Retention.
2. Hematuria.
3. Pyuria (with, perhaps, "triple-phosphaturia").
4. Pain.
5. Sexual impotence.
6. Uremia.
7. Fever, anorexia, diarrhœa, emesis, indicating sepsis.

1. Increased frequency of urination is, perhaps, the earliest symptom, and, as in Bright's Disease, it is at first nocturnal. Later it is troublesome by day as well, and finally passes on to incontinence or overflow. It may be that adenoma or stricture material, within the stretched lumen of the internal sphincter, acts as a foreign body, stimulating the bladder to frequent attempts at expulsion and consequent pollakiuria. Later on, with residual urine, keeping the bladder always partially filled, it has to empty itself more frequently, to make room for fresh urine arriving from the kidneys. Later yet comes the limit of bladder dilatation, and then the urine dribbles away by overflow as fast as it arrives. In cystitis usually the bladder is intolerant of the stretching caused by accumulating urine, and this may be a cause of frequency of urination.

When there is painful pollakiuria, without cystitis or prostatitis in the prespermatic area, it is rather difficult to give a satisfactory explanation, unless one can attribute the symptoms to sub-mucous inflammation of the trigone of the bladder, which has originated in the prostate,—a para-prostatitis or para-cystitis, as it were.

For functional nervous pollakiuria, the name itself implies that we cannot explain it satisfactorily. In the vast majority of cases more careful diagnosis will identify it as prespermatic prostatitis.

2. Difficulty in starting and maintaining the stream is a later symptom, due probably to various causes. When there is valve action of an adenoma in the pre-spermatic or sub-cervical lobe, too much pressure by the bladder on the urine will bring this valve action into play and close the outlet. The handicapped internal sphincter and the external sphincter must open co-ordinately with gentle pressure from above or none at all, to allow of urine to escape. If the hypertrophied middle lobe rises into the bladder as a cone and stretches the internal sphincter, it cannot co-ordinate with the other urination forces, or only with diffi-

culty. Small wonder that in these cases there is "stuttering micturition."

3. Small stream comes early in prostatism, due to narrowing of the bladder outlet. The urine is poorly projected because it has first to pass through this small opening and be voided through a larger-calibred tube. Later on the bladder musculature weakens.

4. Dribbling after buttoning up becomes annoying when the peristaltic action of the musculature of the posterior urethra is interfered with.

Symptoms of complications:—

1. Acute inflammation, local congestion from "cold," constipation, excessive coitus, etc., may swell to occlusion the narrowed calibre of the urethra in prostatic obstruction. Consequent retention may be temporary or permanent. It is probably never caused by uncomplicated stricture or hypertrophy—complete obstruction, if not relieved, results in suppression of urinary secretion.

2. Hematuria, from ruptured mucosal or submucosal capillaries about the neck of the bladder or prostatic urethra may be so severe and persistent as to cause marked anæmia and dominate the picture sufficiently to call for operative relief. Hematuria may also come from erosions into blood vessels in ulcerative cystitis, from calculi, or from tubercular foci, and are then seldom, if ever, very profuse.

3. Pyuria results from invasion of the urinary tract by micro-organisms—the streptococcus, colon bacillus, or mixtures with tubercle bacilli, etc. If the micro-organism tends to break up urea, triple phosphate alkalinuria intervenes, with the passage of its characteristic crystals and secondary stone material. Secondary calculi often form in such urine.

4. Pain. This is not an essential symptom of prostatic obstruction. When it does occur it is probably always due to inflammatory processes, involving nerve endings in the neck of the bladder or pressing on nerve ganglia, or, in case of cancer, to invasion of nerves themselves. It varies in intensity and location.

When there is cystitis, paracystitis, trigonitis or periprostatitis, on the bladder side, or when triple phosphate crystals or stone is present, pain is usually felt at its seat about the neck of the bladder, but also referred to the glans penis and the hypogastrium.

Pain may precede, coincide with, or follow urination. Pain occurring before the bladder contains a normal quantity of urine is usually due to stretching inflamed tissues. Pain following urination may be due to mucous membranes rubbing on each other, on triple phosphate crystals or on stone. Pain during urination is usually caused by inflamed

muscular fasciculæ in the bladder walls changing their tension. Scalding urination is usually due to irritating urine in ammoniacal cystitis.

There is a class of cases in which no cystitis or posterior urethritis is present; the urine is clear, there is no residual, and no contraction of the bladder, and yet vesical tenesmus may be so great as to render life unbearable. These are usually cases of prostatitis involving the internal sphincter.

In prostatitis, whether simple, tubercular, peri-cancerous or peri-adenomatous, there are referred pains simulating lumbago, or sciatica, or located in the sacrum, in Scarpa's triangle, in the hypogastrium, or in the perineum. Head suggested that visceral pain is most frequently referred to surface areas, because the sensorium more frequently receives impressions from these areas and is educated to interpret them, while visceral pain, being infrequent, is interpreted as originating in areas whose nerves enter the same spinal segment and are already translatable, as it were. Prostatic abnormal sensations are consequently referred to surface areas whose nerves enter the same spinal segment with the prostatic nerves. That these areas are far afield on the body surface is the accident of development. In the embryo, the surface areas and their spinal segments correspond more closely. So mimetic of renal disease is the lumbago of prostatitis that nephrotomy has been done for its relief. One should also bear in mind the possibility of prostatitis and of cancer of the prostate in sciatica; in fact, the referred pains of cancer may differentiate it from adenoma.

The pain in vesiculitis and epididymitis need not detain us.

5. Sexual impotence in all degrees, for causes unknown, is a very common sequel of prostatitis, more especially when the verumontanum is affected. On looking over the symptoms of a large number of prostatic hypertrophy cases, it would seem that sexual impotence is no more common amongst these patients than in other people of their age.

6. Uremia comes on late, from interference with kidney function by back pressure of urine, intermittently applied; and consequent anæmia and atrophy of the renal parenchyma; or, it may result from sudden removal of this back pressure, on complete catheterization. Sudden relief of urinary tension to which the blood supply of the kidneys has accommodated itself, causes dilatation, and, perhaps, rupture of the unsupported blood vessels. This uremia has not the grave prognosis of that of Bright's disease. Remove the cause and it disappears permanently.

The symptoms of hydro- and pyo-nephrosis do not obtrude; they are overshadowed by the main condition.

7. Sepsis. Fulminating septic symptoms may manifest themselves in uncomplicated prostatitis, or in aseptic prostatic hypertrophy. Catheterization is probably the most frequent provoking cause. Old cystitis cases, with pyo-nephrosis, become septic more quietly, if at all, having apparently acquired more or less immunity from auto-inoculation.

Diagnosis.—Consideration of the symptoms and a clinical examination usually permit of exact differentiation in cases of prostatic involvement. For tuberculosis of the prostatic urethra, the surgeon is usually consulted before the patient has reached middle life; stricture declares itself from the 30th year on through to old age, but is most common in the fifth decade; hypertrophy and cancer obtrude themselves most strongly on the patient's attention from the 50th year on.

Hypertrophy.—If the patient has passed middle life, Watson and Cunningham say that it is sufficient to find residual urine and an enlarged prostate per rectum, with the single symptom of frequency of urination, to diagnose hypertrophy. The lateral lobes are almost always involved and extend, in their hypertrophy, in the lines of least resistance, up the back of the bladder, where they can be easily felt per rectum. Their soft, elastic consistency is very characteristic. Some forms of hypertrophy, however, are mostly confined to the middle or sub-trigonal lobe and cannot be palpated well per rectum. On attempting catheterization, difficulty proportional to the degree of hypertrophy is encountered, in the posterior urethra; its distortion and increased length can be made out with a Coudë, when other catheters may not be insertable at all. There is no fibrous stricture. The cystoscope reveals the lobes obtruding about the orifice of the bladder, and by turning the beak about, their shape and extent can be more or less fully made out. They may even cover the trigone and render it impossible to find the concealed ureteric orifices. The cystoscope beak is palpable per rectum. The symptoms of complications cannot obscure this picture, if it is kept well in mind.

Stricture.—The patient seeks advice for noctural, frequent and stuttering micturition, a small stream and because he "wets his pants after buttoning up." One usually obtains a history of gonorrhœa and perhaps of the symptoms of cystitis and prostatitis. Per rectum a persisting prostatitis may be made out. There is a small amount of residual urine, slightly decreased bladder capacity, and, on cystoscopy, perhaps some trabeculation of the bladder walls, with a mild trigonitis and cystitis. The cystoscope finds the internal sphincter tight about it. The endoscope probably reveals an enlarged verumontanum. Koll-

man's dilator meets more than normal resistance on expanding it. Such is typical stricture, with its usual accompaniments. On it may be engrafted conditions which cause strangury, hematuria, phosphaturia, pyuria, sexual impotence, or symptoms of septicæmia in all grades.

Tuberculosis of the Prostate.—Is probably always accompanied with pain and the manifest signs and symptoms of tuberculosis in the other parts of the genito-urinary tract, to which it is a secondary involvement. Localizing symptoms of obstruction in the prostatic urethra, with palpation of an inflamed, hard gland per rectum, possibly fluctuant from peripheral abscess, probably adherent to the sides of the pelvis, should be sufficient to settle the diagnosis without urethral instrumentation.

Cancer of the Prostate.—This may give the same symptoms as, and be indistinguishable from, prostatic hypertrophy, in the early stages. Pain simulating lumbago, coxalgia, or sciatica renders one suspicious of cancerous involvement of hypertrophy, but prostatitis, also superadded, will give the same symptoms. When there are areas of stony hardness in the prostate, extending up to the vesiculæ seminales and inter-vesicular space, and obliterating the groove between the lateral lobes, one's diagnosis of cancer hardly needs confirmation by other findings. On instrumentation the sound passes through dense, creaking stricture in the posterior urethra, and the beak of the cystoscope, owing to thickness of the invaded base of the bladder, is non-palpable by rectum. Then diagnosis of cancer far advanced is absolutely clear. In the earlier stages it is important to bear in mind that there may be invasion of ordinary hypertrophy by cancer and in perineal operations a section may be removed for examination. Macroscopically this section may creak when cut and show pin-point yellowish granulations from the squeezing up of pseudo-epithelial cells above the stroma, which may be so much replaced by the cancer stroma as to lose its characteristic striation. Less advanced malignant conditions show up under the microscope on frozen section.

Spasm.—If there is frequent and painful passage of clear urine, with bladder capacity about normal, no residual urine, no discoverable sign of disease of the bladder, verumontanum or prostate, after careful employment of all modern methods, one may be warranted in making a diagnosis of "functional neurosis." Almost always in these rare cases, however, evidences of prostatitis can be found.

Treatment:—(a) *Prostatic Hypertrophy*: — The treatment of prostatic hypertrophy resolves itself into catheterization and operative measures. Drugs can be of no assistance here, except for the relief of complications.

It has been customary to give the patient a catheter to use at first on going to bed, to obviate his rising at night, and later as the obstructive symptoms get worse, for use by day as well. If the patient is well-to-do he may be able to take such precautions as will stave off infection for some time, but the impossibility of freeing the anterior urethra of pyogenic micro-organisms and the reduced resistance of the bladder, render aseptic catheterization practically impossible and infection always supervenes on catheter life. Watson compiled 207 cases of his own, Rovsing's and Caspar's, and finds a mortality in the first two months of catheter life of almost 10 per cent. This is higher than that of prostatectomy or of Bottini's operation. When one considers that the whole course of the life of a prostatic is dictated by the accessibility of a catheter, a sterilization apparatus, and a closet; and that such tyranny is to become more and more intolerable up to the end of physical existence—the promise of alkaline cystitis with its added pain and an odour which will render the sufferer repulsive to himself and friends—the well-nigh immutable march of events towards a low form of septicæmia or the uræmia of obstruction; and withal the best time for operation frittering away; would it not seem that systematic catheterization has had its day, and that the time has come for operative measures to supersede catheter life?

In some cases, however, operation should be deferred for a preliminary course of treatment of a foul cystitis or of an obstructive uræmia.

In the former, drainage should be instituted suprapubically or by catheter till a maximum progress towards cure is secured. The patient should drink much water to render the urine less concentrated, less irritable and better able to wash away the products of inflammation; while urotropin internally and vesical irrigations with cyanide of mercury will render it somewhat antiseptic. The prostatic plexus may be depleted with magnesium sulphate.

Partial suppression and uræmic symptoms so often follow complete evacuation of the bladder with a catheter or on prostatectomy, that as a prophylactic measure it is best, where the residual urine is large in amount not to operate on sight, and thus lose control of back pressure; but to reduce the quantity of urine gradually, partially replacing it as withdrawn, if there is a cystitis, with an antiseptic fluid. A stoppered catheter *à demeure* permits of leaving any desired amount of urine in the bladder and in this way the danger of acute renal congestion, suppression and uræmia can be best combatted. At last, when the kidneys function well without an abnormal *vis a fronte,* the prostatic obstruction can be removed.

Of operative measures to be considered are Electrolysis, X-ray, Goldschmidt's incision through, and Young's removal of, part of a median bar intraurethrally, removal of pedunculated middle lobes intravesically, the Bottini operation, and suprapubic and perineal prostatectomies.

Attempts have been made to reduce the volume of an enlarged prostate with the electric current and results are still being reported on this method of treatment. Considering that we have to do with adenomas, it is difficult to believe that one accomplishes with electrolysis more than a lessening of periadenomatous congestion where the results are immediate. Permanent results can be more surely and easily attained by other means.

The X-ray can perhaps be relied on to reduce the volume of prostatic growths temporarily, but experience has shown that cancers at least so treated often grow more rapidly than ever, after their first decrease in volume. Whether this is always the case in malignant growths, one cannot say, and this dictum may not be pertinent to benign adenomas and here there may be a field for the use of this "double-edged tool."

Goldschmidt, in a recent number of the Annals of Genito-Urinary Diseases, reports good results from incising a medium bar intraurethrally in fourteen cases. He uses his own water-dilating operating urethroscope; and cuts, under control of the eye, from the bladder outwards, towards the veru montanum.

Young's gouge allows of a medium bar to drop a slot cut across a six-inch long endoscope and fill its lumen in such a way that a sliding inner tube, with a cutting edge, may be shoved right through it, leaving a posterior groove into the bladder, and taking a bite out of the internal sphincter, which may not allow thereafter of closing of this orifice of the bladder. As already stated, the external sphincter is said to be sufficient to control urination.

In either of these operations the verumontanum is in no danger, nor would it seem likely that ejaculation would be interfered with.

Both Goldschmidt's and Young's instruments are too recent to give many statistics, but the latter has been used with pretty manifest success a number of times and the former has fourteen so-called successes to its credit. The great advantage of either of these operations is that they produce the least mutilation and are accompanied by the least danger in the relief of obstruction. Their disadvantage is that they may not be sufficiently radical, and may have to be supplemented by more complete measures later.

Bottini's operation also may be used for median bar obstruction, but one looks askance at a 6.3 per cent. mortality in 1,154 cases, reported on

by Watson. These cases were probably much more favorable for operation than the usual prostatectomy ones and this operation seems to be losing ground except in the haunds of Freudenberg, of Berlin, who has considerably modified the original Italian model of instrument. Besides danger to life from secondary hæmorrhage or sepsis, the chance of puncturing the rectum and thus forming a recto-vesical fistula is to be borne in mind.

In cases where a pedunculated hypertrophied median lobe protrudes into the bladder, in one case at least, Young has been able to reach and remove it with an intra-vesicular rongeur of his own devising. This instrument is so made that its cutting jaws are always in the cystoscopic field and operate under complete visual control.

One may meet such an amount of adenoma that its complete removal is the only rational course to pursue, and then one has to consider.

Choice of route (Supra-pubic or Perineal.) — Freyer's method of supra-pubic prostatectomy offers the following advantages: It is done more quickly and easily on the enucleable adenomas, there is complete removal of the obstruction and, if stones are present in diverticulæ, they can be reached, while incontinence following the operation is almost unknown. On the other hand should the tumour predominate in stroma elements it cannot be shelled out and the finger is a weak instrument with which to remove it, and if instruments must be resorted to, they have to be used without guidance of the eye. Hemorrhage is perhaps freer,—certainly it is at the time of operation,—and this objection is to be well weighed in the old. That the whole prostatic urethra, down to the verumontanum is removed, and with it even sometimes the ejaculatory ducts, renders thereafter ejaculation from the urethra impossible. This is of serious import to many prostatics. Yet again, when the patient is old, the necessarily prolonged stay in bed, required by the difficulties of supra-pubic drainage, may contribute to the slightly higher mortality of this operation. Supra-pubic fistula sometimes persists, if an alkaline cystitis is present, and is most annoying.

Young's perineal removal offers the opportunity of a dissection under the guidance of the eye, causes less bleeding, at least at the time of operating, gives dependant drainage, usually preserves the ejaculatory ducts and prostatic urethra intact, and, should a fistula persist, it is a perineal pin-point one, which is dry except at urination. He claims for it that sexual powers are not interfered with. Its crowning advantage is that a frozen section of a prostate supected of cancer can be examined microscopically at operation, then and there, and should it show malignancy, the prostatic urethra and neck of the bladder may be removed. Its dis-

advantages are that it is essentially an operation of skill, requires more time, and does not allow for removal of diverticulated stone, and if not well done, the most annoying of all fistulæ (the recto-urethral), may follow, or the obstruction may not be completely removed, or even incontinence may be a sequel to too much trauma to the membranous urethra and internal sphincter.

Wallace says it is impossible to distinguish in advance in what condition an adenoma of the prostate may be and as cancer may be present in any hypertrophied prostate, the perineal route would seem to be always indicated. Nevertheless, one is inclined to consider the large, soft, elastic prostatic adenoma to be so infrequently the seat of cancer and so easily enucleated from above that this route to reach them is best, while the perineum offers the best method of approach in all other conditions calling for prostatectomy.

Blind enucleation by the finger, through a perineal slit, is admitted by Watson to be difficult, until the sense of touch is educated to it. One who has not done this operation many times must ask himself how such an education is to be got. Certainly very few surgeons can acquire skill by removing hypertrophied prostates post-mortem, and other prostates must be well nigh unenucleable, if one may judge from attempting it supra-pubically. This method may be indicated when speed in operating is called for and the abdominal wall is weak or when speed in operating is called for and there is alkaline cystitis.

Albarran's perineal operation sections the ejaculatory ducts and ties the vasa deferentia near the testes, after vasotomy. These measures guard against epididymitis, but the price seems too high. He also sutures the urethra to obviate fistula. Deaver's packing of the prostatic cavity to control hemorrhage would seem unnecessary, in view of Freyer's experiences, and may encourage infection, while Leguell's method of stitching the mucous membrane of the bladder over the empty prostatic cavity, is open to the same objection.

Stricture:—When one has diagnosed stricture of the internal sphincter, Kollman dilatation is first indicated. The bladder should be thoroughly irrigated and 200 c. c. of water left in to facilitate operation. The instrument to be chosen should be the posterior Benequè dilator, the expansile part being short enough not to be grasped by the external sphincter. The blades can be opened easily to 50 French, normally, and with only spasm resistance, and this should be approximately attained and maintained, before one can feel confident of cure. Combined with this one should also give prostatic massage, as such a stricture will hardly ever be unaccompanied by a prostatitis of sufficient extent to call for

treatment thus per rectum. Hydraulic dilatation of the bladder may be called for simultaneously. Should dilatation be exceedingly painful, the stricture dense and resistant, or contract quickly after stretching, and the above measures promise no result, or only with excessive loss of time, Goldschidt's intra-urethral incision of the neck of the bladder behind, is to be considered. One may cut from the bladder out towards the verumontanum, under water distension of the posterior urethra and if one follows it with Kollman dilatation, there is no obvious reason why good, permanent results should not be attained here, as in urethrotomy. It is probable that such an internal sphincter would still act as well as before operation, even as the external sphincter can be incised longitudinally and recover function completely.

When the complication of a contracted bladder is present, whether acute cystitis persists or not, injecting it forcibly with water stretches its walls much as a urethral stricture is stretched by Kollmann's dilator. A paracystitis so treated is cured by the increased influx of blood to its muscular tissue, and because some restful paralysis follows the stretching process, much as over-dilatation of the external sphincter of the rectum allows a fissure of the anus to heal. The one contraindication to this treatment is, of course, tuberculosis of the bladder.

Cancer of the prostate should be removed *en masse* if it has not spread beyond its original seat or even if it has involved the base of the bladder provided it has not reached the level of the ureters. Young's operation for removal perineally of the cancerous prostate, posterior urethra and neck of the bladder after partial closure of the incision into it, is always followed by incontinence and usually by recurrence; but earlier diagnosis and treatment may give better results. One of these patients was well three months ago though over four years had elapsed since operation. When cancer is apparently confined to the prostate, enucleation of the enveloping adenoma may be sufficient. As yet one cannot dogmatize here too strongly. If the disease is far advanced supra-pubic drainage only may be indicated to supplement a morphite treatment. Ureteral transplantation into the groin or drainage of the kidney pelvis across its parenchyma may be considered as likely to give more rest to the involved tissues; but at the stage at which they would be of use the patient is usually too weak to submit to them.

Tuberculosis:—For tuberculosis of the prostate, Albarran reports one prostatectomy without sinus resulting, but the later march of events, so far as I know, he fails to report. These operations generally end disastrously and when nature is here walling in a tubercular focus, with fibrous tissue, it is decidedly best to use nothing but accessory treat-

ment. It may be advisable to remove a primary focus in a kidney or epididymus. For the last nine years an outdoor patient has been reporting at the Johns Hopkins Hospital with tuberculosis of the prostate. He seems to hold his own without treatment.

Spasm :—For functional spasm one will do well to bear in mind that treatment directed to chronic prostatitis, such as massage, urethral dilatation, etc., is most likely to reach the over-looked cause of this condition, but when every other treatment is proven ineffectual, vasectomy, as recommended by Casper may be permissible.

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Eugene St. Jacques of Montreal, Canada, gives a careful account of the advantages for study, medical and post-graduate, in Germany and France. He describes the way in which instructors and professors are selected. In both countries the professors are selected by the faculty from their number or from outside. In Germany the endowment and laboratory equipment are splendid. Each clinic has its own laboratories. Little importance is given to theoretical teaching, all being clinical and practical. In post-graduate work there are two courses each year, fall and spring. In France, Paris is the centre. There are thirty hospitals, all under city control. Here, also, clinical teaching is the rule. Facilities for dissection are very great; hospital work is fine. For the student and graduate all hospitals are open freely, to follow the physicians and examine patients. Tuition is free; access to patients is free; the hospital physician is a brilliant speaker and clinician. Paris excells in skin, nervous, and genito-urinary diseases, in surgery, and bacteriology. In Germany laboratories are more numerous and better equipped, and research work is extensively carried on. Clinical facilities are greater in France. Post-graduate work is more practically organized in Germany.—*Medical Record*, August 14, 1909.

THE

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EDITED BY

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MONTREAL'S CIVIC QUESTIONS.

We make no apology for putting forward our views upon the questions about civic government that are to come before the electors of Montreal on the 20th of September. We believe that much abuse has existed in the administration of the city, and we believe that the reduction in the number of aldermen and the institution of a board of control elected by the popular vote are likely to be followed by betterment. Many measures, often referred to in these columns, are concerned: a more perfect water-supply, the establishment of a filtration-plant, the medical inspection of school-children, the inspection of meat, of other food stuffs, especially milk, the proper cleaning of the streets and the lanes are all questions that particularly interest the medical profession and therefore this journal. As long as one dollar of the civic revenue is misapplied, as long as aldermanic or other influence improperly applied tends to the appointment of inferior administrators, it is not only our privilege but our duty to protest. We know our water-supply is not perfect, we are not sure that our medical inspection of schools is sufficiently complete, we suspect that not all the meat is seen by the small staff of inspectors, and our infant mortality shouts aloud its evidence upon the question of pure milk, our eyes bear testimony to the dirt of our streets, and our noses tell us about the lanes. The departments concerned with these may be administered quite properly: the evidence given before the Royal Commission shows us that there are grave abuses in other departments. If money is being improperly spent or is being embezzled in

these other departments, every department must suffer. We are all concerned in these affairs, and we are glad to think that the French-speaking citizens of Montreal are just as sick of all this maladministration as are the English-speaking: we hope that both together will make an effort on the 20th of September to bring about a better state of affairs.

THE HOSPITAL AND ITS STAFF.

A decision of interest to hospitals in general was recently given in the Court of Appeal in England by Lord Justice Farwell in the case of Hillyer *vs.* The Governors of St. Bartholomew's Hospital. The facts of the case seem to have been that Dr. Hillyer brought action against the hospital because while under an anæsthetic, being examined by Mr. Lockwood, his arms were allowed to hang over the table and to come in contact with a hot-water tin: there was also pressure upon the arm which, he claimed, caused traumatic neuritis and paralysis. In throwing out the appeal, the judge stated that no negligence had been proved. But the most interesting part of the judgment concerns the relation of hospital and staff. A hospital, like any other public body, is liable to responsibility for the acts of its servants notwithstanding the charitable nature of the work it may do; but the surgeon, the assistant-surgeon, the house-surgeon and the administrator of anæsthetics are not servants of the Governors of the hospital. Lord Justice Farwell said: "they are all professional men employed by the defendants to exercise their profession to the best of their abilities according to their own discretion; but in exercising it they are in no way under the orders or bound to obey the directions of the defendants. The true relations of the parties is, in my opinion, well stated by the Chief Justice in 'Glavin *vs.* Rhode Island Hospital' where the Chief Justice said:—'Here the physicians or surgeons are selected by the corporation or the trustees. But does it follow from this that they are the servants of the corporation? We think not. If A out of charity employs a physician to attend B, his sick neighbour, the physician does not become A's servant, and A, if he has been duly careful in selecting him, will not be answerable to B for his malpractice. The reason is that A does not undertake to treat B through the agency of the physician, but only to procure for B the services of the physician. The relation of master and servant is not established between A and the physician. And so there is no such relation between the corporation and the physicians and surgeons who give their services at the hospital. It is true the corporation has power to dismiss them, but it has this power not because they are its servants

but because of its control of the hospital where their services are rendered. They would not recognize the right of the corporation, while retaining them, to direct them in their treatment of patients.' "

The further statement is made that even nurses and orderlies, even if admitted to be servants of the governors of a hospital, cease to be so as soon as the doors of the operating room have closed upon them, and come under the sole orders of the operating surgeon: "the surgeon is for the time being supreme and the governing body cannot interfere with or gainsay his orders. This is well understood, and is indeed essential to the success of operations; no surgeon would undertake the responsibility of operations if his orders and directions were subject to the control of or interference by the governing body. The nurses and orderlies, therefore, assisting at an operation cease for the time being to be the servants of the defendants, inasmuch as they take their orders during that period from the operating surgeon alone and not from the hospital authorities."

Such decisions, apart from the legal points involved, tend to show that the law is in sympathy with the good faith of properly-run charitable institutions; and the fact that hospitals are being protected more and more from the attacks of those who have grievances, will not lessen their care of their patients in the slightest, because the quality of their work is upheld by motives so much higher than those of mere self-protection.

The editor wishes to state that a physician who is willing to replace an English-speaking doctor, or to act as locum tenens to such, can be communicated with by addressing this journal, P. O. Box 273, Montreal.

Dr. S. S. Oppenheimer has removed from Greenwood, B.C. to Spokane.

Reviews and Notices of Books.

The After Treatment of Operations. By P. Lockhart Mummery, F.R.C.S., Eng., Bailliere, Tindall and Cox, London.

This volume deals with the after-treatment of operations and all the numerous complications which may arise. The treatment and dressing of the wound itself, the various conditions which may arise in it, and the treatments for sepsis are fully discussed. Two chapters are devoted to the causes and treatment of hæmorrhage following operation and the modern treatment of shock and collapse. Complications following the anæsthetic, post-operative rashes and drug rashes are discussed and treated, as also the causes, symptomatology and treatment of post-operative thrombosis. The after-treatment of the various operations on different parts of the body is thoroughly taken up together with the complications that may arise. The work on the whole is excellent; that on the after-treatment of operations on the abdomen and general peritonitis deserves special mention and is practically sound and up-to-date. Two chapters are devoted to the treatment of genito-urinary and rectal operations, followed by a valuable appendix on rectal alimentation.

The Practical Medicine Series, 1909, in ten volumes, Gustavus P. Head, M.D., General editor in charge. The Year Book Publishers, Chicago.

Vol. 1. General Medicine, edited by Frank Billings, M.S., M.D., and J. H. Salisbury, A.M., M.D.

Diseases of the respiratory organs are first taken up, as also the recent advances in general diagnosis and therapeutic measures. The latest work on tuberculosis with its special methods of diagnosis and treatment, the different forms of pneumonia and the various infecting organisms, with the conditions arising therefrom, are concisely treated. Under diseases of the circulatory system the work on the diagnosis of diseases of the heart, both functional and organic, the pulse and its variations, and the blood pressure deserve special mention. Under diseases of the blood the various anæmias and purpuras are taken up with their cytodiagnosis and the significance of the same. Infectious diseases and diseases of the ductless glands and constitutionel diseases form an important chapter, and a final section is devoted to diseases of the kidneys and uræmia.

Vol. 2. General Surgery, edited by John B. Murphy, A.M., M.D., LL.D., Chicago.

It is impossible in the space of a brief review to give any comprehen-

sive idea of the contents of this volume. It contains all of the very latest work done in surgery within the past year so arranged that it may be referred to in an instant, and is invaluable. The advances made in anaesthesia, both local and general, in X-Ray radio-therapy, in modern operative technique and instruments, observations made on wound healing and pathologic interventions, take up the first part of the volume. Then follow the ophthalmo-reaction, tetanus and anthrax, diagnosis and treatment of tumours with statistical results therefrom; the advances made in the general surgery of the various parts of the body, and special mention should here be made of the surgery of the blood vessels, skull and brain technique, the neck and thyroid, the thorax, pulmonary embolism, abdominal surgery, the peritoneum Fowler-Murphy treatment; stomach surgery by W. J. Mayo; intestinal anastomosis, F. B. Walker; the intestines, the appendix, the sigmoid and rectum, hernia, the gall-bladder, pancreas and kidney, all of which are excellent.

Vol. III. The Eye, Ear, Nose and Throat, edited by Casey A. Wood, M.D., C.M., D.C.L., Albert H. Andrews, M.D. and Gustavus P. Head, M.D.

The examination and refraction of the eye is first taken up, especially the functional diseases due to eye strain in school children. This is followed by the advances made in the bacteriology of the diseases of the eye, especially the cultivation of the meningococcus from epidemic cerbro-spinal meningitis by McKee and the spirochæta pallida in ocular lues. The lids, trachoma, the cornea and advances made in cataract extraction are well discussed, together with the optic nerve and retina, the orbit, glaucoma, ocular injuries and symptoms, etc. These are followed by advances in technique, instruments, etc. and ocular therapeutics. In the section on the ear the diseases of the middle ear are first taken up and their relation to those of the throat; these are followed by those of the mastoid, brain and sinuses and their treatment and the operation on the frontal sinus and nasal tuberculosis deserve special mention. In the section on the nose, the different forms of rhinitis and the turbinate bodies with their treatment are first taken up after the the physiology of the nose has been thoroughly discussed. The physiology and diseases of the accessory cavities are then taken up and the operative treatment described. Empyema of the antrum and Jansen's operation on the frontal sinus and nasal tuberculosis deserve special mention. Naso-pharyngitis and disease of the tonsils and their relation to deafness and tuberculosis is well set forth. Diseases of the larynx, laryngotomy, defects of the voice, bronchoscopy, followed by the latest

observations on hay fever and general therapeutics of the nose and throat conclude this volume.

A Handbook of the Diseases of the Nose and Throat. By Eugene S. Yonge, M.D. (Edin.). Wm. Green & Sons, 1909.

Under the above title there appears a very good volume of the text-book type.

The reader is given a good general idea of the subject, though, as the author says in his preface, in a book of this kind many important subjects are necessarily condensed and abbreviated.

The work is arranged into sections devoted to: (1) The nose, sinuses and naso-pharynx; (2) The pharynx; (3) The larynx, with a brief review of the anatomy and physiology of each region, at the beginning of the section. A fourth section deals with the local manifestations of infective and other constitutional conditions.

On general lines the views set forth are sound and conservative and are clearly expressed. The illustrations are numerous and instructive, adding not a little to the attractiveness and usefulness of the volume.

E. H. W.

The Faith and Works of Christian Science. By the writer of "Confessio Medici." Macmillan & Co., Limited, St. Martin's Street, London, 1909. The Macmillan Company of Canada, Ltd., Toronto, publishers. Price, $1.25.

Our only fear is that the writer of "Confessio Medici" has done Eddyism too much honor in writing this book: in the perusal of the first chapter one is apt to think that the author has taken off his coat, stepped down into the ring and purposes to come to handgrips; in short, he appears to be taking the meaningless vaporings of Mrs. Eddy seriously, but step by step the reader becomes comforted. "If Christian Science is to grow after Mrs. Eddy's death, her demonology..... must die with her. Otherwise, it will drag the entire system up before that bar which no obsession ever yet has faced and lived, the bar of the universal sense of humor." Surely Eddyism has been at that bar long ago, and is there now, not dragged up but having danced up gaily like some over-night intoxicated charwoman who still has fumes in her brain; the spectators may have laughed at first, but they are tired, and wish she would betake herself once more to her scrubbing. The author of "Confessio Medici," let it be said, grants Christian Science her cures, and the basis of his arguments is not to assail these, but to point out that she can cure functional and cannot cure organic disease. Since the brazen serpent was lifted up in the wilderness, the mind has been exerting its influence over

the body under a hundred different names: Mrs. Eddy has put her vulgar "theology" forward as if she were the inventor of that divine physiology and some half million of mankind in their wisdom have left all and followed her. The title page quotation is "Then the Devil taketh him up into the holy city, and setteth him on a pinnacle of the temple, and saith unto him, If thou be the Son of God, cast thyself down."

Here, also, are two hundred cases of cures from the Christian Science Sentinel between April and August, 1908, with their uncertainties and their lay diagnoses, mostly in fact "auto-diagnoses": set against them are cases communicated to the writer where Eddyism has been not a blessing but a curse, where little children have been burnt in the Moloch-arms of their silly progenitors, commonly called parents. While one speaks of children, a foot-note on page 214 has this apt comment. "An eminent London physician..... found that the mother was an 'ardent' Christian Scientist: 'but,' said she, 'I do not apply it to my children.' A strange sort of God if you cannot bring young children to Him."

The book is a good one, too good for the shams and ghosts it combats: the author (by this time, everyone can name the writer of "Confessio Medici") is an honest man, indignant at the folly and the delusion of silly poor people, poor only in the sense of the Laodicean church who said, "I am rich, and increased with goods, and have need of nothing": and knew not that she was "wretched and miserable and poor and blind and naked."

J. McC.

Textbook of Gynæcological Diagnosis. By Dr. Georg Winter, Professor and Director of the Kgl. Universitäts-Frauenklinik in Königsberg, Prussia, with the collaboration of Dr. Karl Ruge, of Berlin. Edited by Dr. John G. Clark, Professor of Gynæcology in the University of Pennsylvania. The English work is from the revised third edition of the German work. Four full page plates and three hundred and fifty text illustrations in black and in colors. J. B. Lippincott Company, Philadelphia, 1909.

This German textbook is recognized in the medical centres of Europe as the most thorough and modern work of its kind, and the new third edition has greatly increased its well deserved recognition. Prof. Clark's translation of this work is admirable and stamps this volume as by far the most complete work on Gynæcological Diagnosis that has appeared in the English language. It is a volume which few general practitioners and specialists can afford to be without, and it will undoubtedly find a prominent and ready to hand place in the library of the scientific practitioner.

It will appeal to the practitioner and specialist equally but for different reasons: to the former on account of the completeness of the work upon the subjects of histology, methods of examination, gynæcological differential diagnosis and owing to the last chapter which is devoted to the interpretation of symptoms and signs: to the specialist, also, on account of the foregoing, but chiefly owing to the thorough manner in which Dr. Ruge has handled the difficult subject of gynæcological pathology. There is probably no branch of gynæcology which is so difficult to arrange systematically, no branch undergoing such radical changes owing to recent researches, and no branch that has been so neglected. Dr. Ruge, drawing from his wide experience, has given us here in this volume a most valuable, complete and thoroughly modern exposition of this difficult subject, such as, I think, is not to be found in any textbook on gynæcology.

The volume is divided into three sections. The first section is devoted to general diagnosis, the second to special diagnosis, and the third to analytical diagnosis. The first part, comprising 125 pages, deals with external examination, internal examination, combined examination, rectal examination, cystoscopic examination of the appendages, methods of using specula, the uterine sound, microscopic diagnosis, cystoscopy, bacteriological diagnosis and radiography. The second part comprises over 500 pages and is by far the most valuable part of the volume. It deals in a most thorough manner with the whole subject of gynæcological diagnosis, and especially valuable are the divisions treating of malignant growths and inflammations. The chapter upon parametritic processes, their character of infection, their mode of spreading, their most frequent sites for localization, diagnosis of deposits, etc., constitutes one of the most complete expositions of the subject.

The third part, about fifty-five pages, takes up the analytical diagnosis, i.e. the interpretation of symptoms and signs,—the causes of hæmorrhage, dysmenorrhœa, leucorrhœa, sterility and the analytical diagnosis of abdominal growths. A separate chapter deals rather cursorily with diseases of the bladder and the use of the cystoscope.

The work in the original is the best of its class, and the English translation not only has not as most translations detracted from its merits, but rather has proved what an excellent translation can be produced when treated by a competent writer.

THE LAST DAYS OF CHARLES II. By RAYMOND CRAWFURD, M.A., M.D., Oxon., F.R.C.P., Oxford. At the Clarendon Press, 1909.

Dr. Crawfurd has set forth in a very interesting way the last illness and

death of Charles II., the book being the result of "an interlude of illness in the midst of an active professional life." The bibliography is wonderfully extensive, comprising forty or more sources, and the narrative is well built upon these. The conclusion of the author is the reasonable one that the king died, not from poison, as was hinted, nor from apoplexy, as was averred, but from uræmia with convulsions, supervening upon chronic nephritis of the granular type. The conclusion is not an important part of the book: the whole story is merely a readable version of a historic event, with excellent and interesting illustrations, published in the good style of the Clarendon Press. J. McC.

HYDROTHERAPY. A brief summary of the practical value of water in disease, for students and practicians of medicine. By WILLIAM H. DIEFFENBACH, M.D. Published by the Rebman Company, 1123 Broadway, New York. Cloth, $3.00.

This volume, which is the out-growth of Prof. Dieffenbach's lectures during the last seven years, is a volume well worth reading for any one interested in this subject.

After taking up the action of water of various temperatures on the different organs of the body, the author describes the various manners in which it is usually applied, illustrating this generously with very good photographs; in the several chapters following this he takes up the treatment of the various diseases from a hydrotherapeutic standpoint. In these chapters the general practitioner, and even the specialist will find many hints and suggestions helpful in the care and treatment of patients. The book is well indexed and contains 267 pages. It is well bound in the usual Rebman style.

C. K. R.

MYOMATA OF THE UTERUS. By HOWARD A. KELLY, M.D., Professor of Gynæcologic Surgery at Johns Hopkins University; and THOMAS S. CULLEN, M.B., Associate in Gynæcology at Johns Hopkins University. Large octavo of 700 pages, with 388 superb original illustrations by August Horn and Hermann Becker. Philadelphia and London. W. B. Saunders Company, 1909. Cloth, $7.50 net; Half Morocco, $9.00 net. W. B. Saunders Company, Philadelphia and London; J. A. Carveth & Co., Ltd., Toronto, Canadian agents.

At a time when the authors of most American medical works are, at best, but editors of recent home and foreign literature, it is a pleasure to find a new book written from the experience of one man, and yet giving the reader a definite basis for appreciation of the wideness of

that man's experience and the soundness of his judgment. The authors have collected statistics from some 1674 clinical and pathological reports at the Johns Hopkins and several other hospitals, and has analyzed them thoroughly. With such a large amount of material at hand he, and a number of co-workers to whom he gives full credit in his introduction, has admirably selected not only the most interesting cases, but those likely to be instructive to the reader, and, with the aid of the really 'superb' illustrations of August Horn, has produced a singular book.

The extensive case reports will perhaps weary the majority of readers, but the illustrations, even better than those in the well known "Carcinoma of the Uterus," will appeal to the operator clinician, or pathologist, and any of these will at the same time find in the text well-substantiated opinions on every possible feature of the subject.

Medical News.

PROFESSOR PFANNENSTIEL.

Many readers of the Montreal MEDICAL JOURNAL will hear with regret of the death of Professor Pfannenstiel of Kiel, who was a visitor to Montreal early in 1908. The following is an appreciation of Pfannenstiel by Professor Fritsch of Bonn, in *Zentralblatt für Gynækologie* of July 31st, 1909.

"Johannes Pfannenstiel, for more than twenty years a zealous contributor to the *Zentralblatt*, died on the third of July.

Pfannenstiel was born in Berlin on the 28th, June 1862, received his education in that city, and in 1885 graduated as a physician. After two years as assistant in the Civic Hospital at Posen, he entered the Breslau Frauenklinik to take a similar position. In 1890 he was made Privatdoctent, and in 1893 moved from the Frauenklinik. In 1896 he was made professor.

From the year 1896 till he was called to Giessen, he directed a large gynæcological service as chief physician in the Hospital of the Elizabethinnerins in Breslau.

His call as Professor Ordinarius and Director of the Frauenklinik and School for Midwives in Giessen came in 1902. In 1907, after refusing a call to Freiberg, he accepted a call to a similar position in Kiel.

As a teacher of Pfannenstiel I have wondered from the beginning at the untiring energy, the true devotion to his duty, and above all the conscientiousness of his work.

Among the Gynæcologists of the present day he took high rank; if one takes as an ideal professor of medicine, a good teacher, an industrious scientific investigator, and an experienced and humane physician, everyone will admit that Johannes Pfannenstiel possessed these three characteristics in a remarkable way. His talented and captivating address and his ability as a teacher assured him the love and respect of colleagues and pupils. His numerous contributions, more or less extensive, notably his epoch-making work on the diseases of the ovary, brought him fame not only in Germany but in the entire medical world; his new methods of operation, notably the transverse abdominal incision, are everywhere known and practised. The best evidence of Pfannenstiel's ability to ensure the confidence and love of all, has been the wide, heart-felt and deep sympathy expressed for his unexpected, sad, untimely end. A brave fighter for mankind has fallen a victim to his calling.

I, myself, full of sorrow, lose a tried and loved friend who had given me many evidences of his gratitude and affection.

Pfannenstiel's path in life led only upward to fame, honour, and success; the sad descent in resignation and disillusion was spared to him. Great is the loss to science, to those in need and, not less, to his friends."

THE AMERICAN ASSOCIATION OF CLINICAL RESEARCH.

A meeting of physicians and surgeons interested in Scientific Clinical Research is called for Wednesday, October 27, 1909, at John Ware Hall, Boston Medical Library, No. 8 Fenway, Boston, Massachusetts. The meeting will come to order at 10 A.M., and carry its sessions through Wednesday, and, if necessary, through Thursday and Friday.

The object of the meeting is,

First, to establish an American Association of Clinical Research; Secondly, to establish clinical research on an incontrovertible scientific basis in hospitals; and Thirdly, to institute an American Journal of Clinical Research, in which the work of members of the American Association and of others doing clinical research work in a scientific manner shall be published.

This invitation is extended to all physicians and surgeons whose interest goes beyond the immediate case work of ordinary clinical societies; and it is hoped that the invitation will be accepted by all medical practitioners, irrespective of their present medical affiliations, who can appreciate the necessity for establishing on an incontrovertible scientific basis the certainties and limitations of the present practice of medicine and surgery before attempting to add to the already large and cumbersome field of medicine.

The American Association of Clinical Research is not intended to disturb the present medical affiliations of its members nor to interfere in the very least with the duties they owe and the privileges they enjoy by virtue of their affiliation with any existing national medical body.

The American Association of Clinical Research is to take cognizance of the fact that the clinic requires cold facts and conclusive methods, and upon these fundamental requirements, the structure and the work of the American Association of Clinical Research are to be built.

It is of the utmost scientific importance to establish conclusively all that is at present true in medicine and surgery, and only upon such proved knowledge, to base any further advancement. The clinic deals with clinical entities and not, like the laboratories, with parts as entities. Therefore, clinical research differs, and must differ, from experimental laboratory researches. Clinical research must consider clinical entities, and when considering parts, it must consider them only as parts and not as wholes. All that subserves the object of obtaining and investigating clinical facts and principles belongs to clinical research and the laboratory is a part of the means of clinical research, but only a part.

The crux of the matter appears to be that experimental laboratory proof is not sufficient clinical proof. In order to advance in an irresistible line, clinical research must be based on a conclusive form or method of clinical proof. In experimental proof, we dislocate a part from a whole and attempt to prove the whole from the part, as though a dislocated part could always prove the whole. Or, we attempt to prove facts in one species by facts in another species, as though the two species were identical. For instance, the experiments made on animals to elucidate certain elements of fever bring out a fact of almost insurmountable difference between man and the lower animals, the fact that man has associated with the nakedness of his body a highly perfected power for regulating his temperature, a highly developed vasomotor system and a vast array of sweat glands, a characteristic complex of things which apparently no other species of animal life presents. Experiments made on animals to prove febrile or other clinical phenomena in man, may be suggestive, but for obvious reasons cannot be conclusive. To prove observations in man, the observations must be made on man and not on animals. But observations on man even are not necessarily conclusive. Individual observations on man cannot be conclusive, because the same experience cannot be repeated, and when we prove by numbers, we compare similar but not identical experiences. Analogy is not conclusive proof. Identity alone is conclusive proof; but since, in medicine, identical experiences cannot be repeated, we must provide simultaneous identical experiences in order to have proof by identity. Clinical proof

is conclusively established when all observations and experiments are made conjointly by at least two competent men, preferably of opposite ideas, at the same time. Conjoined critical observation and experiment, at the bedside and in the laboratory, as may be required, furnish simultaneous identical experiences, the proof proceeding on the principle that a whole can be proved only by the whole and not by dislocated parts.

These and other weighty questions await your assistance for a necessary solution. The benefit that will accrue, both to medicine in particular and to the medical profession and humanity at large in general, from a satisfactory establishment of scientific clinical research, can be easily surmised. Come prepared, yourself and your friends, to give to this matter your mature convictions and your personal assistance. Only from a critical interchange of critically acquired opinions, can we hope for clearness and for the clarification of the medical atmosphere now charged with confusion and difference.

Your communication, indicating your interest and your expectation of being present at the meeting in Boston on October 27, next, is eagerly awaited, and on receipt of the expression of your interest, further developments will be communicated to you personally in due time.

Any interested are asked to address communications at the earliest possible date directly to JAMES KRAUSS, M.D., 419 Boylston Street, Boston, Massachusetts.

Retrospect of Current Literature.

MEDICINE.

UNDER THE CHARGE OF DRS. FINLEY, LAFLEUR, HAMILTON, AND HOWARD.

VARIOUS AUTHORS. Gout. *The Practitioner,* July, 1909.

The entire July number of the Practitioner is given up to a series of papers upon Gout by fourteen different authors; and the perusal of it makes one inclined to say that definite statement as yet upon this subject, is somewhat premature; stated otherwise, we scarcely know enough about this obscure subject, as yet, to make its statement worth while. English writers and others have accumulated a vast store of experience and observation upon hygienic measures which are worthy of adoption by certain well-fed ill individuals, and a certain amount of this knowledge is doubtless properly applied to "gout" but much of it is applied to cases that are not gout. In fact, the trouble is that as yet we scarcely know what we mean by gout, and we certainly do not know what a good many other people mean by gout: we are often mistaking some obscure arterial disease for gout, and we are at times referring to equally obscure intestinal absorption as gout: but the disease

seems to be becoming hazier rather than clearer. Fortunately, the "uric-acid" patter has disappeared from such articles as those to which we refer, and the idea seems to have got its quietus in the best circles, although it is still rampant in the public mind.

The last article, by Dr. A. W. Sikes, very usefully recapitulates the recent literature upon the subject; the purin bases and uric-acid, two products of proteid metabolism, have continued to excite much investigation; uric-acid has long ceased to be considered as a cause of gout, and now the purins tend to go to the same road, but it must be admitted that excess purins do often make gouty cases worse. Colchicin, useful as it is in gout, has apparently no effect on metabolism or on the excretion of purins, but affects leucocytes, first diminishing but afterwards increasing them. Hypoxanthin, a purin base, is produced normally in muscle, according to Burian, and is then oxidised to uric-acid, which is then partly destroyed by the liver and partly excreted by the kidneys. Exercise tends to increase the purin-bases excretion but the total purin, including uric-acid, is not much affected. Sir Dyce Duckworth deals with dietary, and expresses some scepticism upon the generally prescribed diets, and sounds the note of moderation. His permission to his patients regarding wine and spirits is fairly wide, as to quality, but he draws the line upon quantity: a reviewer is apt to get the idea that many gouty Londoners do not readily yield an implicit obedience on the question of food and especially of drink. The real point of the paper is a sensible, very necessary one, viz., that moderation means more than any selection. Dr. James F. Goodhart's paper is so interesting that we wonder to see it appear under such a title: "The Treatment of Uric-Acid," as a title, is the sort of thing of which we in America are frequently guilty, but the Practitioner ought to be above it.

Dr. Goodhart condemns the artificialities of protein foods, the rich gravies, the sauces, the spices more than the foods themselves, and in general shows a proper scepticism about the evils of red meats: fats, salt, acids are more likely to be dangerous. "Perhaps someone will now say, 'what then, is your own treatment for these uric-acid troubles?' Well! I have not got one."

Dr. Arthur P. Luff deals with the "Treatment of Gout in its Various Forms," and approaches the subject with a serious hypothesis as to its causation, developing the special treatment required for each form of the disease, and indicating the measures necessary for prophylaxis. One useful means of treating gouty joints referred to is by passing an electric current into the joint through a solution of the fluid or through cloths wet with some such substance as potassium bicarbonate or lithium iodide.

Under the heading of treatment of irregular gout, Dr. Luff deals with a number of symptoms which may be the result of gout, but which are necessarily indefinite, such as dyspepsia, hyperchlorhydria, hepatic torpor, phlebitis, sciatica, and insomnia. This indicates how insecure is the diagnosis of gout, because the fact that these symptoms or signs arise in a gouty man does not necessarily, mean that they are caused by the cause of gout: and the "cerebral" form of gout shows us how near we are to arterio-sclerosis (which term, by the way, is often as obscure as is the term "gout" itself). Dr. Luff deals with the question of diet, as do the previously mentioned writers, in a broad-minded way: it is moderation in all, rather than selection, that is required.

Dr. Samuel West, dealing with the relation of gout to the granular kidney and to lead-poisoning, gets us back to our starting point. "Excess of uric-acid in the blood.....we are bound to consider as the essential factor in gout." In developing the subject, the writer points out that the relation between gout and the granular kidney is not a constant or an essential one. Although gout and lead produce marked renal changes, neither causes granular kidney: yet granular kidneys greatly increase the liability of their possessor to the attack of one or the other or both.

Upon the cardio-vascular manifestations of gout, Dr. Percy Kidd takes, reasonably, very non-committal ground: he indicates those writers who hold that definite gouty valvular change does occur, and on the other hand, those who hold that the cardiac manifestations are largely of a functional type. Dr. Kidd evidently feels a well-grounded scepticism on the "gouty heart," and points out that the desideratum is a really reliable clinical test for gout before we can declare that the cardiac signs so often found in the so-called "gouty" have any definite relationship to the disease. Dr. James Taylor in dealing with gout in relation to disease of the nervous system prefaces his remarks with the statement that these are indirect. He believes that glycosuric peripheral neuritis is a true gouty ailment, as is also sciatica. The border line between the gouty and the arterial lesions is evidently hard to define in the mental changes associated with both. Dr. Galloway in the cutaneous manifestations of gout has an easier task. Gouty eczema, undeniable in its causation, requires protective, anti-pruritic remedies; the treatment may readily be overdone.

Three papers follow upon the balneological treatment of gout, and each at bottom does full justice to the physiological effect of spa-life, and its good effect on elimination without exploiting, to too great a degree, the special water concerned.

Mr. C. G. Watson has some excellent plates showing the joint-changes of gout, and Dr. J. E. McCracken writes upon gouty throat: he indicates the importance of pyorrhœa alveolaris, and the usefulness of formamint tablets, which are supposed to set free formaldehyde in the saliva. He points out that the effect of this may be largely in the stomach and intestines.

In reviewing all that has been said from many different standpoints, one is struck by the unanimity with which these writers agree upon the basal facts of treatment, and whatever gout may be, it seems certain that the so-called gouty are being treated in their hands upon the basis of common-sense.

J. McC.

Telling. "The Rheumatic Infection." *The Practitioner,* May, 1909.

After "clearing the ground" somewhat, the writer says "the view that the Rheumatic Infection is a *specific* infection is that toward which bacteriological and clinical research more and more converge. At present there are many pathologists who, while accepting the hypothesis of specificity, assert that the microbe has so far eluded discovery, but in England, at least, the researches of Triboulet, Poynton and Paine, Beattie, and others have carried conviction to the minds of many that the *micrococcus rheumaticus* which they describe is the cause of Rheumatism.

While pathologists may yet differ, Telling urges the view that notwithstanding the variety of cases these, if studied closely, will strongly support the view that rheumatism is a clinical entity and the atypical "rheumatisms" are of a different pathology.

The family history—a particular physical and mental type, the presence of one or more of the symptoms included in the "Rheumatic Series," the most important manifestations of which are arthritic phenomena, fascial inflammations (including fibrous nodules) cardiac lesions, chorea and certain skin eruptions; and the symptom—complex and general course of the disease conforming to a particular type which, too, may clearly be recognized, the rheumatism of childhood and the rheumatism of the adult,—these enable the clinician to make a diagnosis with "an approach to accuracy."

In the rheumatism of childhood the frequency of the disease in near blood-relations is most marked and this frequency remains after careful exclusion of those cases loosely termed rheumatism.

Telling, while urging that rheumatism is essentially a disease of childhood and early adult life, broadly contrasts the two types, emphasizing the necessity of understanding the great difference in type,—that "the

history of rheumatism may be the history of a whole childhood," and that rheumatism may be limited to a single event, e.g. an arthritis, an endocarditis, or a chorea.

What constitutes the physical or the mental type is somewhat difficult of definition. The child is "nervous," "emotionally unstable." Physically it approaches what is known as "pretty struma," with long dark lashes, bright-coloured clear complexion, often with red or auburn hair.

After considering the question of an acute onset of so-called rheumatoid arthritis and the diagnostic value of the salicylates in suitable doses, the writer discusses the relation of rheumatism to chorea and concludes this paragraph with the remark that "our only duty to our patients is to treat every case of chorea as if it might be rheumatic." "Beyond rest in bed, I wonder," says Telling, "whether any drug shortens the course of chorea? I have tried most treatments but remain for the most part unconvinced of the real value of any of them; I think, however, the salicylate treatment deserves a more extended trial."

A timely and most reasonable plea for rest is presented while dealing with the subject of Cardiac Lesions—even in those cases of rheumatism in children where there is only a suspicion of endocarditis or myocarditis.

Erythema nodosum is regarded as having a very doubtful connection with the rheumatic infection. In 68 cases the author will admit that six showed at most a possible connection and six a very improbable connection with rheumatism.

Peliosis rheumatica of Schönlein is a disease needing a separate classification.

Edgeworth "On the diagnosis of Transitory Hemiplegia in elderly persons." *Practitioner,* May, 1909.

The writer refers in the first paragraph of this article to those of Bastian, in 1875, and Daly, in 1887, Savill, in 1897, and of Russell, in 1901, and to others more recent, all of which contain reports of such hemiplegias with certain theories advanced to explain them.

The four cases which are reported in this number of the *Practitioner,* are of more than ordinary interest. In the first case, there was a sensation of numbness "coming and going in waves" and slight loss of voluntary control in the right arm and hand. The finer movements of the right hand and fingers were a little fumbling, while the gross voluntary movements of the limbs were normal. Sensation was normal. The observation was made late one evening and by the next morning all symptoms had disappeared. In the second case there was aphasia and right hemiplegia. This patient had a similar attack two years before. Both attacks were transitory and disappeared within 24 hours. In the

third case there were also aphasia and paralysis of the right hand and foot. In this case the patient had suffered off and on for five years, from pallor and numbness of the second, third and fourth fingers of the right hand. By the following day the hemiplegia had disappeared and the retention of urine which accompanied the hemiplegia lasted for a day longer.

The fourth case was that of a patient who suffered during the last eight months of her life from frequent cerebral disturbances shown by motor aphasia, left hemiplegia, giddiness, and mental confusion. Each attack lasted from 24 to 36 hours, and began as a rule in the early morning: she woke up paralysed. It was invariably found that such attacks were associated with a cord-like condition of the radial artery and an incompressible pulse. The administration of nitroglycerine — 1 minim of the liquor every 10 minutes—brought about in five or six doses a relaxation of the hypertonus and as soon as this occurred the paralysis rapidly grew better and disappeared. The writer says that there was no obvious physical cause of these paralytic attacks. They were not preceded by constipation nor excess in diet, nor by gastro-intestinal disturbances. On the other hand, little worries or frights seemed to bring them on. Six days before her death she had an incomplete paralysis affecting the right arm and leg, while the face and tongue and speech were not affected.

During these eight months she had had two attacks of left hemiplegia, six attacks of aphasia, three attacks of vertigo, and three of vertigo and mental confusion.

It seems that such attacks as are described in the above four cases may be associated with: (1) No arterio-sclerosis, no hypertonus, no rise of blood pressure, or (2) arterio-sclerosis but no general hypertonus or rise in blood pressure, or (3) arterio-sclerosis, general hypertonus and rise in blood pressure.

The adequate explanation of these various cerebral phenomena is found in the theory of a localized hypertonus—an arterial spasm in cerebral blood vessels. Such a theory may be supported by the following arguments.

(1) It is recognized that localized arterial spasms may occur in parts of the body other than in the brain, for instance, in the extremities, in Raynaud's disease.

(2) In some cases the paralysis may be preceded by clonic spasms in the paralysed limb, or the attack may consist of a clonic spasm only. Such phenomena resemble the unilateral clonic spasms which may be produced by compression of one of the carotid arteries, and a general convulsion which may occur in Stokes-Adams disease.

(3) In some cases there may be a striking parallelism between the state of the radial artery and the cerebral phenomena.

(4) It was formerly thought that the cerebral arteries had no vaso-motor nerve supply, but the recent experiments of Wiggers show that vaso-constrictors are present.

The diagnosis of this class of paralysis is by no means easy especially when seen in the first attack. It was thought that the state of the tendon reflexes might aid materially in this matter. All that can be said on this point, however, is that, if the plantar reflex is extensor in a case of suddenly occurring hemiplegia the cause is an organic one; if not extensor the disease may be, though exceptionally, of organic origin, or it may be due to vascular spasm. Again the absence of any plantar reflex on the paralysed side does not serve to differentiate the cases, for this may occur, not only in those transitory cases but also, though exceptionally, in organic cases.

The onset of those cases due to vascular spasm is usually unattended by loss of consciousness. The rise of blood pressure is common in hemiplegia of hæmorrhage and may be present in the hemiplegia of spasm. Altogether the question of diagnosis as the author points out is one of more than academic interest as the treatment is of great practical importance. Experience shows that the administration of vaso-dilators in quantities sufficient to make the pulse quite soft will rapidly cure the condition, while the administration of such remedies in hæmorrhage or thrombosis may make matters rather worse than better.

WILLIAMSON. "Variations of Arterial Blood Pressure in Cases of Arterio-Sclerosis." *Practitioner,* May, 1909.

It was with the end in view that the physician might be able to detect in its early stage the process which leads to arterio-sclerosis, that Williamson undertook the investigation of blood pressure, studying the alterations brought about by change of posture, ingestion of food and the time of day at which the observations were made. By way of introduction he reviews the opinion of several authorities on the above mentioned points. His conclusions are as follows:

(1) In cases of arterio-sclerosis blood pressure readings taken in the evening tend to be lower than the morning reading, in other words the normal diurnal variations tend to be reversed.

(2) In the majority of arterio sclerotic and non-sclerotic cases, change of posture from recumbency to sitting causes a rise of arterial pressure affecting either the systolic or diastolic pressure or both. The change from the sitting to the standing position on the other hand, corresponds in a majority of the cases of arterio-sclerosis to a fall of systolic pressure

and a rise of diastolic pressure. The same tendency is noticed in the non-arterio-sclerotic cases.

In the cases of arterio-sclerosis whether associated with high or low blood pressure, the physiological alterations in arterial calibre as the result of change of posture from recumbency to sitting, is in a majority of instances reversed. The variations in arterial calibre resulting from change of posture are, in the arterio-sclerotic cases, on the average approximately normal in amount and seem to be about equal to those in the non-arterio-sclerotic cases.

(3) As the result of ingestion of food a fall of pressure affecting either the systolic or both systolic or diastolic pressures seems to be more frequent in the cases of arterio-sclerosis than in the non-arterio-sclerotic cases, and an equally common result in the arterio-sclerotic cases in an inverse variation of the systolic and diastolic pressures. This is likewise seen in the non-arterio-sclerotic cases.

W. F. H.

SURGERY.

UNDER THE CHARGE OF DRS. ARMSTRONG, BARLOW, ARCHIBALD, AND CAMPBELL.

W. Körte, Berlin. "Operations upon the Gall Passages." *Archiv für klinische Chirurgie, Bd. 89, Heft I, p. 1.*

Körte in the above article gives an extensive resumé of his experiences in the surgery of the gall passages extending over four years terminating December, 1908, referring in detail to forty cases representing various unusual or severe complications. During this period two hundred and fifty-four operations in all were performed with a death rate of nine per cent. Exclusive, however, of thirty cases presenting severe or multiple complications, two hundred and twenty-four cases were operated upon with seven deaths—a death rate of 3.1 per cent. Of the thirty cases thirteen were cured and one improved. The sixteen deaths were due to complications existing prior to operation.

The author is of opinion that all cases of acute purulent cholecystitis should be subjected to immediate operation; that the dangers of such procedure are very much less than those resulting from such probable complications as rupture, perforation through necrosis of pressure of calculus, peritonitis, liver abscess, etc. As a further argument he urges that a gall bladder which has once been the seat of purulent inflammation, owing to the extensive destruction of the mucous membrane, adhesions to surrounding organs, or possibly fistula formation, can never again become capable of distention and contraction; and that even in cases where the acute inflammation subsides, a re-

crudescence of the affection must be looked for. Finally, in support of his contention Körte states results obtained. In an earlier series published, twenty-two out of twenty-five cases recovered, the three deaths being due to complications which existed prior to operation, and in the present paper Körte reports thirty-six new cases of acute purulent cystitis operated upon in the acute stage without a single mortality. In the latter series some of the cases presented gangrene of the wall—others foci of suppuration outside the gall bladder. In seven of the thirty-six cases coexisting stones were found in the common duct and were removed by choledochotomy; in six other instances it was necessary to employ drainage of the gall passages owing to the existence of an ascending infection. In connection with this latter series it is interesting to note that symptoms of gall bladder disease were absent in fifteen cases prior to the onset of the acute infection. The sudden onset with violent pain in the right side and vomiting gave rise in a number of instances to a primary diagnosis of appendicitis. In other cases there was a history of attacks of "peritonitis," while in still others the earlier symptoms had been attributed to gastric disturbances.

Körte believes that as a rule acute suppurative cholecystitis follows cystic occlusion by stone: only two exceptions to this rule occurred in the thirty-six cases.

Primary cystectomy was performed in thirty-three of the thirty-six cases. In two drainage of the gall bladder or gall bladder duct was alone employed. In a third complicated by pancreatitis primary drainage and at a subsequent sitting cystectomy and choledochotomy was the mode of procedure.

To return to the original series,—there were sixty-two cases of chronic empyema of the gall bladder, twenty-seven of which were associated with stone in the common duct. In sixty-one cases primary cystectomy was performed, combined in forty-three cases with duct incision (in twenty-seven cases for stone and in sixteen for more perfect examination of the gall passages). In one case primary drainage was followed one week later by extirpation of the diseased gall bladder. In four of the above series pus was encountered outside the gall bladder,—in one instance between the gall bladder and the abdominal wall and in three cases between the gall bladder and the stomach. Two deaths occurred in cases complicated by stone in the common duct and one death where empyema of the gall bladder alone existed.

Of chronic calculous cholecystitis one hundred cases were encountered—forty-five of these cases being associated with stone in the common duct.

Two deaths occurred in cases complicated by common duct stone and infected bile.

Of hydrops of the gall bladder there were four cases, two of which were complicated by stone in the common duct. In all cases radical operation was carried out without mishap.

Of chronic cholecystitis without stone there were eight cases. These cases had suffered from time to time from severe attacks of pain simulating gall-stone colic. Adhesions were found at operation in all cases. Examination of the extirpated gall sacs showed the presence of chronic inflammation. Pancreatitis was present in three cases. Excision of the gall bladder associated in two instances with drainage of the common duct was practised. One fatality occurred from gangrenous perforation of the gut, due, it was thought, to embolism.

The operative technique of cystectomy remains essentially the same as that formerly described by Körte. The incision begins near the middle line in the epigastrium and extends outward parallel to the margin of the ribs, then descends obliquely downwards and outwards to the level of the umbilicus. The inner portion of the rectus muscle near its attachment to the costal margin is obliquely divided. The outer portion of the rectus together with the lateral nerve remains undisturbed apart from blunt dissection. In the upper part of the abdominal wound division of the ligamentum teres, which should be subsequently sutured, gives better access. In addition to the protection of the abdominal muscles from infection, the field of operation should be isolated from the colon, omentum, stomach and duodenum by means of gauze sponges. In separating the gall bladder two flaps of serosa are provided to cover the denuded liver. After separation of the bladder the cystic duct is divided between clamps. Where the duct is distended with fluid, aspiration before division should be practised. More difficult than the removal of the large inflamed gall bladder is that of the small, sclerosed, usually friable bladder which lies deeply under the liver, especially when that organ is the seat of chronic cholangitis. The author is greatly impressed with the importance of a thorough examination of the gall passages (the cystic, common, and hepatic ducts), without which no one can with certainty exclude the possibility of stone or tumour. Where many small stones are found in the bladder, one must in every case slit up the cystic duct to the point of its entrance into the common duct. In cases where one meets with one or more large stones and the cystic duct is narrow and its mucous membrane normal, one may be reasonably sure that the deeper passages do not contain concretions.

Where stone exists in the common duct, where there is doubt as to the

presence of such calculi, or where turbid secretions can be expressed through the cystic duct, choledochotomy should be carried out. In ninety-two choledochotomies fistula and stricture formation occurred in one case only.

For all deep sutures Körte has returned to iodine cat-gut as the most satisfactory.

The classic symptoms of gall-duct stone—icterus, the absence or diminution of bile in the fæces, colic, chills and fever, and the absence of palpable gall-bladder dilatation—are by no means always present. The differentiation of this affection from tumour occlusion may also be most difficult, and while one can from operative procedure obtain good results in cases of occlusion by stone even under critical conditions, it is quite otherwise in cases of gall-duct occlusion through tumour, where the chances of a favorable outcome are small.

In ninety-two cases icterus was twenty-five times either absent or very slightly observed. In some of these cases the choledochus concretion was small: in other cases, however, there were found medium-sized and quite large concretions. Two cases of icterus were observed in the absence of stone, due to inflammatory swelling of the papilla.

Riedel has drawn attention to insidious cases in which periodical attacks of fever and chills, followed by slight icterus or perhaps without icterus, and associated with weakness, arise as a result of choledochus concretion.

A small, shrunken gall-bladder is usually associated with occlusion by stone—a large, palpable gall-bladder with obstruction by tumour; and while this Courvoisier-Terrier law holds good on the whole, there are many exceptions (thirty-five per cent in Körte's series).

A retroduodenal position of the stone was met with nine times. In only three cases was duodenotomy performed in order to remove papillary stones. Körte has not noticed any bad results from this procedure, but avoids it if possible.

Körte employs drainage of the gall passages in all cases of choledochotomy, the drain remaining in from ten to twelve days, and in exceptional cases longer. Further, in all such cases a drainage tube is placed in the field of operation, to provide for escaped secretions or plugging of the duct tube. Körte has seen but one persistent gall fistula after the removal of the drain. Sometimes gall escapes for a time, but as a rule the fistula closes quickly if all stones have been removed.

Where stone obstructs the gall-duct the gall is often turbid or distinctly purulent. In seven of Körte's cases where no stone was met with turbid infected gall was withdrawn and a drainage tube inserted.

Körte lays stress upon the maintenance of drainage where small, dark particles about the size of a pin head or hemp seed occur in the gall which flows from the liver, and the employment of irrigation (sterile water) until clear gall is discharged. These bodies were shown by Rona to consist of bile pigment, carbonates and phosphates, but he was unable to suggest a suitable solvent. Körte believes that alkaline drinks hasten their disappearance.

This sediment evidently forms in the hepatic ducts following occlusion by stone, and where the ducts are dilated much of this sediment may be present. Körte considers the presence of these bodies a proof that concretion-formation may take place not only in the bladder but also under certain conditions in the gall passages of the liver, and also that their presence has an important bearing upon relapses.

Part II of Körte's article deals with the more severe complications.

Acute peritonitis due to perforation of the gall-bladder was met with seven times. Two cases recovered following operation: five died. These seven cases show that the danger of perforation in suppurative inflammation of the gall-bladder is not slight. In every case recovery might have been secured by timely action. It is worthy of note that the two cases which recovered underwent operation very soon after perforation.

Purulent cholangitis following obstruction by stone in the ductus choledochus was found twenty-six times, and without stone in seven instances. Although referred to before, it is well to lay stress upon the necessity of providing drainage of the gall passages in all cases where the gall is infected, whether stone be present or not. As Körte points out, it is but a step from this condition to the grave complication of hepatic abscess and necrosis.

The writer finally touches upon the question of tumours of the papilla and pancreas in their relation to biliary obstruction.

E. M. von E.

Professor Dr. Hans Kehr. "Fifty-Nine Noteworthy Operations upon the Gall System." *Archiv für klinische Chirurgie, Bd. 89, Heft, I, p. 97.*

In this extensive article Kehr has selected fifty-nine cases for detailed report from a series of two hundred and thirty cases of disease of the biliary passages operated upon during the years 1907 and 1908.

The cases reported are grouped under the following headings:

I. Cystostomies. In over two hundred cases cystostomy was practised only seven times: twice where there was a co-existing pancreatic necrosis;

once where there was a luetic infection of the liver; and in the remaining cases on account of constant retching under the anæsthetic. Kehr re-cites the following reasons for performing cystostomy as seldom as possible:

(*a*) Cystostomy does not give any security that the cure is permanent.

(*b*) Even if further stone formation does not take place, subsequent inflammation of the damaged gall bladder is likely to occur (17 per cent of the author's earlier cases).

(*c*) Fixation of the gall bladder to the abdominal wall and the formation of permanent adhesions frequently give rise to unpleasant dragging sensations.

(*d*) Small stones in the cystic duct are readily overlooked in cystostomy.

(*e*) The death rate in cystostomy is hardly one per cent less than in cystectomy.

II. Carcinoma.

III. Errors in diagnosis, etc., including appendicitis, pyloric obstruction following cholecystostomy, mistaken diagnosis of hysteria, persistent fistula and the results of a forgotten tampon.

IV. A series of sixteen cases in which simple cystectomy was performed.

V. Eleven cases in which, in addition to cholecystectomy, appendectomy, gastroenterostomy, or excision of an ecchinococcus cyst was carried out, and which are from the point of view of differential diagnosis especially interesting.

This paper, together with that by Körte reviewed in this issue, is a valuable contribution to the literature on this subject.

E. M. VON E.

G. W. CRILE, Cleveland. "Further Observations on Transfusion, with a Note on Hæmolysis." *Surgery, Gynæcology, and Obstetrics,* July, 1909.

Dr. Crile in this short report reaffirms the conclusions to which previous work had led him with regard to the value of direct transfusion of blood, discusses at some length the behaviour of the heart during the procedure, brings out prominently certain points in the technique, and adds a short note upon the question of hæmolysis in the blood of the recipient.

"As to clinical results," he says, "there has been no recent evidence which justifies any material modification of the conclusion previously given:—that, in pernicious anæmia, toxæmia, certain drug poisonings, leukæmia, Hodgkin's disease, carcinoma, and uræmia, no benefit has

been observed." .... "If performed before irreparable damage has been done by the anæmia, transfusion is specific in acute hæmorrhage. In suitable cases it has been of very great value in the prevention and the relief of the circulatory phenomena of shock."

It has been amply proved that preliminary, contemporaneous, or, if necessary, post-operative transfusion is of extraordinary value in the cases of grave, or even impossible, operative risk. Notably is this the case in two classes of patients;—those in whom there has been serious, perhaps continuous, internal hæmorrhage; and those who have been reduced by long illness, starvation, or otherwise to a condition quite unsafe for the operation indicated.

As to the heart, Crile says that this organ has shown itself to be the most important consideration in transfusion. The heart muscle itself is peculiarly dependent upon a sufficient circulation and oxidation. In severe anæmias, the myocardium is, and for long, perhaps, has been, anæmic. This impairment of its nutrition leaves it with a much narrowed margin of safety; so that, during transfusion, it may be unequal to carry the increased burden thrown upon it by the rapid influx of fresh blood from the full-pressure donor, and heart dilation may follow with the result of threatening or actual cardiac paralysis. "This condition is best met by careful adjustment of the rate of flow, and by having an assistant continually percussing the heart dullness, so that at the first sign of dilatation the flow is checked or stopped." Digitalis is also recommended.

At the end of the article there is added a couple of paragraphs upon the vexed question of hæmolysis in the procedure under discussion. Crile remarks that a hæmolysis *in vitro* does not necessarily imply a hæmolysis *in vivo*. "In fact, their agreement may be the exception. For example, I have transfused eighteen cases of tuberculosis. In most of these the donor's blood hæmolized the blood of the recipient in the test tube, but not in the patient. On theoretic grounds, transfusion in these cases should be fatal, but in practice no unfavorable results appeared."

F. Legueu, L. Morel, and H. Verliac. "Rectal Anæsthesia." *Archives Générales de Chirurgie,* June-July, 1909.

The induction of anæsthesia by means of ether vapor introduced into the rectum is by no means a new procedure. Scarcely had ether itself been discovered, or rather its anæsthetizing properties been discovered, before it was suggested that it might be used by way of the rectum. In the one year, 1847, Roux made the suggestion; his interne, Dupuy, carried it out successfully on laboratory animals; and Pirogoff applied it

in the human. In spite of Pirogoff's *imprimatur,* the method fell into disuse, until, in 1884, there occurred a sort of renaissance of rectal anæsthesia, in Lyons and in America. Poncet, however, on the basis of experiments in animals, soon condemned it in no measured terms; and again it was not until within the last few years that the method has attracted much attention, chiefly, this time, through the investigations of Dumont of Berne, Cunningham of Boston, and Leggett of New York.

The present article reviews the whole matter with the usual Gallic clearness of exposition. The disadvantages and advantages are set forth in order and discussed. To summarize, the method possesses two undoubted advantages over narcosis by inhalation:—a more rapid recovery, and a lessened tax upon the lungs; it possesses certain advantages of more doubtful nature:—freedom of the operative field in operations upon the head and neck, a more rapid induction of anæsthesia, a lessened consumption of ether, a diminution in post-anæsthetic vomiting, and a greater efficiency in the case of alcoholics.

On the other side there is much to be said. Many of the patients complain of colic and tenesmus during the early part of the induction. This, like certain others of the objections raised, depends more on a faulty technique than upon the principle of the method.

Meteorism is a more serious matter. This is usually so great as to constitute in the author's opinion an absolute contraindication to all laparotomies.

Cardio-respiratory disturbances have been not infrequent, from the mere alarm to collapse and actual death on the table. Such accidents are doubtless due to an overdose; the anæsthesia becomes not a *rectal* one alone but an *intestinal* one. In this point, the reviewer sees an analogy with the spinal analgesia, in that, the anæsthetic once introduced, it becomes difficult if not impossible to prevent the drug exercising its complete effect after danger symptoms have appeared; one can do little either in the way of withdrawing the drug or in hastening elimination. The patient has to be tided over such conditions by stimulants of various sorts; his ultimate safety depends on his own reserve fund of vitality.

In the fourth place, the patients not infrequently suffer after operation from colic, tenesmus, dysenteric diarrhœa with serous or even bloody stools. This, the American school has maintained, is chiefly due to the entrance of liquid ether into the rectum, and may be avoided by an improved technique. The authors conducted a series of experiments upon rabbits, and found the constant presence of severe congestion of the rectum and colon, going on usually to surface ulcerations, but going on also in two instances to perforation of the sigmoid flexure. Anschütz and Baum in one patient found at autopsy two weeks after a rectal

anæsthesia numerous intestinal ulcers in process of healing; in another patient, a perforation of the cæcum was apparently caused, with death in twenty hours from fulminating peritonitis.

In spite of these grave objections, the authors, upon the basis of animal experimentation, and with the introduction of certain modifications of technique, conclude that the method has a very definite place in surgical practice.

They advise, first of all, the preliminary use of ethyl bromide, just as in New York Leggett advises beginning with ether by inhalation and continuing by the rectal route. The authors proved apparently that this early anæsthesia relaxes the ileo-cæcal valve, thus allowing an even distribution of the ether vapor from the start through the whole intestinal tract, and an accurate following of the ordinary signs of anæsthesia. They also advise a mixture of oxygen with ether vapor, and claim that they obtain in this way a very smooth anæsthesia with a more normal maintenance of cardiac and pulmonary function. As to their apparatus, this conforms in the main to the principles laid down by Cunningham and by Leggett, with an intervening bottle of water for the ether to pass through, and a safety exit for intestinal gases or fluids. In addition it provides a separate inlet, by a Y glass tube, for oxygen. With this method, their animals showed very little intestinal congestion and no ulceration. They also find that the various disadvantages above mentioned are largely circumvented; there is practically no meteorism, no diarrhœa, no tenesmus, no intestinal rupture, and no danger of cardio-respiratory failure above that of inhalation. This last was due to a primary resistance of the ileo-cæcal valve, with subsequent sudden yielding and sudden overwhelming of the small bowel with a large amount of ether collected in the large bowel. The preliminary administration of bromide of ethyl overcomes the valve at the beginning, and the anæsthesia then becomes regularly progressive and therefore capable of being intelligently followed as in the inhalation method.

In conclusion, the method when carried out with intelligence, and with the use of ethyl bromide and oxygen, is not more dangerous than the inhalation method; its disadvantages, due to the older technique, are largely overcome. It is inapplicable in the presence of intestinal derangements, acute or chronic abdominal diseases, and perineal or genital operations. It offers no advantage over other methods in operations on the extremities, but does offer indisputable advantage in operations on the head, neck, and thorax. Finally it is a method to be used only as an exception.

E. A.

RETROSPECT IN DISEASES OF CHILDREN.

T. Wood Clarke. *Amer. Jour. Med. Sci.*, May and June, 1909.

Clarke gives a useful review of medical literature on gastric digestion in infants and finally adds some of his own investigations in that subject.

Before the days of the stomach tube work was of but little value beyond that of Langendorff, demonstrating pepsin in the stomach of a dead fœtus (1879). Work on autopsy material or on animals has not been of much assistance.

Kussmaul first used the stomach tube (on adults) in 1867, but it was not used on infants till Epstein showed its therapeutic value in 1880. Raudnitz first examined the stomach contents in 1887 though Leo in 1888 was the first to make systematic examinations in a large number (134) of cases. In 1889, Puteran published 1,027 tests in 248 normal infants. Since this date many publications have appeared chiefly on four details, viz.: motility, acidity, pepsin digestion, and rennin coagulation.

While there are many contradictory results, the following statements are apparently reliable, viz.:

All the factors present in the adult are found in a weaker form in the infant.

In the new-born at the breast the stomach empties itself in from one to one and a half hours, this time increasing with the age.

The few drops of juice found in the stomach before a meal are the remains of the previous meal and not a secretion.

The motility is more rapid in breast-fed than in bottle-fed infants and more rapid in the healthy than in the sick.

The acidity immediately after a meal is nil, but appears shortly and increases during digestion, being greater in older than in younger children. On a diet of barley-water free hydrochloric acid appears in several minutes, but on a diet of milk it does not show itself for an hour or more, the casein in the meanwhile absorbing the free acid. In disease the free acid appears later than in health. In pylorospasm the acidity is increased.

Lactic acid and volatile fatty acids probably do not occur in normal breast-fed infants, but are fairly common in artificially fed or sickly children. Part of the acidity is due to a fat-splitting enzyme in the stomach.

Pepsin is constantly present at all ages in health though to a slighter degree than in the adult. Peptic digestion goes on to peptones—not further. Stomach contents at times will not digest fibrin because the

acid has been combined with casein, and foreign protein without addition of more acid will resist the enzyme. Rennin occurs in the stomach after the first few weeks; whether it appears in the first week is unknown.

Clarke in his second paper then reports 122 observations on 24 infants as near normal as possible and varying from 2 to 8 months of age. From those he concludes that:—

1. Motility varies inversely with the concentration of the food, thus more dilute foods may be given more frequently.

2. Lime-water does not reduce acidity, neutralization of some acid being overcome by increased stimulation of acid; the net amount may even be increased.

3. Sodium citrate markedly reduces acidity by production of sodium chloride.

4. Barley-water has no constant effect on gastric digestion.

5. The type of infants with persistent vomiting shows either hyper-acidity or hypo-acidity.

6. Test feedings show to which class a case belongs.

7. Five per cent. solution of milk sugar is the best material for a test feeding. This should be left in for 30 minutes and may be followed by a mixture of milk and water to test the degree of response of the gastric glands.

8. Protein digestion is slight and proportional to the amount of hydrochlorid acid present.

Martha Wollstein. "The Site of Tuberculous Infection in Infants." *Archives of Internal Medicine,* April, 1909.

Martha Wollstein publishes statistics on the vexed question of the commonest site of tuberculosis infection in infants. Her figures are based on 185 autopsies on tuberculous infants under 3 years of age and also on other autopsies.

Of all infants under 1 year of age coming to autopsy, 12 per cent. had tuberculous lesions; of those in the 2nd year, 36 per cent. had tuberculous lesions and of those in the 3rd year, 33 per cent. Of infants under 3 months of age 1.8 per cent. had tuberculosis.

In the 185 tuberculous cases 13 had lesions limited to the respiratory tract and only 1 showed lesions involving the intestines alone. Four additional cases were of undoubted intestinal origin while 40 were equally clearly of respiratory origin; 1 was of mixed origin. In 8 cases the mesenteric lymph nodes were involved without an intestinal lesion, but with a pulmonary involvement. Of intestinal ulcers most were in the lower ileum. In the kidneys young miliary tubercles were found in 67 cases, usually in both kidneys. Pulmonary lesions varied from miliary

tubercles to cheesy areas and cavities. The right upper lobe was that most frequently affected.

This study thus showed the rarity of undoubted intestinal tuberculosis and the predominance of the respiratory origin over the alimentary. The tendency of the tuberculous process in lymph nodes is toward degeneration as caseation and suppuration were the rule in these cases.

F. M. F.

TRAUMATIC NEUROSES.

The divergent opinions held by physicians and lawyers in regard to what are called traumatic neuroses are noticed by E. E. Gaver, Columbus, Ohio (*Journal A. M. A.*, July 17), and owing to the tangled condition thus caused, he thinks worthy persons often fail to get just compensation, while unworthy ones sometimes recover damages. While he does not believe that the German system of insurance against accident is a perfect solution of the problem involved, it is, he says, a great improvement over no system at all, as is the case here. The special features of the three cases he reports are as follows: The first was diagnosed as an organic case and operated on for brain abscess which was not found. Later it was diagnosed as a case of traumatic neurosis of the hysterical type, which it proved to be and the patient recovered entirely, after obtaining damages from the city where the accident occurred. The second case was one of hysterical traumatic neurosis manifesting a rather fragmentary dissociation of personality, and the third was a temporary insanity from head injury, with former dissipation as a possible contributing factor. There are few cases of traumatic psychosis in which some such preceding factor, or heredity, can be absolutely excluded.

John R. Hicks of New York says that all methods of technique used in the ophthalmoreaction are faulty in that they do not sterilize the eye before making the instillation. Harmful microbes in the eye are facilitated in their action by the use of the test solution, and cause ulceration that is severe in some cases. The author explains his method of sterilization of the eye by using antiseptic solutions in the eye for a week before instillation. He has obtained positive tests in the eyes of patients in whom there was no tuberculosis when the eye was not sterilized.—*Medical Record,* Aug. 7, 1909.

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TUMORS OF THE SIGMOID.

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From the foregut we get the stomach and duodenum to a point below the common duct, and the liver and pancreas. These organs derive their blood supply from the cœliac axis, and all are concerned in the preparation of food for absorption but do not themselves absorb. From the midgut we get the duodenum below the common duct, the jejunum, ileum, cœcum, ascending and transverse colon, all of which derive their nourishment from the superior mesenteric artery, and are concerned in the absorption and assimilation of food.

The derivatives of the hindgut are the descending colon, sigmoid and rectum. These organs are nourished by the inferior mesenteric artery and are concerned in the temporary storage of intestinal waste for convenient evacuation. This storage function is greatly aided by an antiperistalsis which exists here except during defæcation.

The sigmoid is the natural fæcal container and is a later development showing the effects of this short heredity in the variations in size, shape, and length, as well as in function. Constipation largely concerns the sigmoid. The anatomical descriptions of the sigmoid by the Americans differ from those of English anatomists in three important respects: First, the English divide the sigmoid into two parts; the iliac which is six or seven inches in extent and closely attached to the iliac bone, having little or no mesosigmoid, and the pelvic sigmoid, sixteen or seventeen inches in length which passes across the midline of the body into the right pelvis before reaching the rectum. This portion usually has a long mesosigmoid and permits of great mobility.

The second important point of variance between English and American anatomists, is that the English include as part of the sigmoid all

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the intestine which has mesentery and which ends at about the third sacral vertebra; while the Americans name this distal portion the "first" part of the rectum.

Third, the American so-called "third portion of the rectum" is embryologically derived from the proctodæum or skin segment and embraces that muscular portion an inch or an inch and a quarter in length, described by Symington as the anal canal.

Embryologically the English view is the correct one as the rectum proper is derived from the cloaca which afterwards becomes divided into the bladder and rectum.

The sigmoid is only about one-half the calibre of the ascending colon, its sacculations are smaller and the longitudinal bands are greatly increased in width and strength. It receives its arterial supply from the sigmoid vessel, a large branch of the inferior mesenteric, and from the superior rectal, which is a direct continuation of the inferior mesenteric. Above, the sigmoid vessels anastomose freely with the left colic, and below with the middle hæmorrhoidal branches of the internal iliac. The lymphatic glands of the sigmoid are few in number and slow to take offence. This sparseness of lymphatics is, of course, a necessity because of the poisonous nature of the sigmoid contents, but this fact makes cancer of this organ less rapid in effecting glandular metastasis.

The lymph channels follow the arterial supply. The highest gland is the one described by Moynihan at the origin of the inferior mesenteric vessel.

Tumors in the iliac sigmoid are held closely in the iliac fossa. Tumors of the pelvic sigmoid are usually to be felt in the left hypogastrium and may often be moved to the right of the mid-line, or, by bimanual examination be discovered in the pelvis, or possibly directly palpated with the finger in the rectum if intussusception exists. If there is no obstruction there is much less gastrointestinal disturbance than with tumors involving the cæcum and ascending colon. In suspected tumors of the sigmoid, the bowel should be thoroughly cleared out in order to eliminate the possibility of mistaking scybalous masses for tumor. In doubtful cases anæsthesia, or the examination of the patient while in a warm bath to relax the abdominal muscles, is exceedingly advantageous. Tumors lying in the lower sigmoid can often be detected by the sigmoidoscope, and points of narrowing may be discovered by radiographs after introduction of bismuth mixtures.

Among the symptoms of tumor of the sigmoid must be placed disturbance of function causing irregularity of the bowels, and gripings attended by discharges of mucus, blood, and occasionally a little pus. These mucus discharges are not necessarily accompanied by fæces. Very

often there is an unsatisfied feeling, with straining, after the evacuation from the bowels. In the majority of cases the first real evidence of tumor is brought about by interference with the progress of the bowel movement, giving rise to pain and borborygus, accompanied by "stiffening" of the intestine and visible peristalsis. This partial obstruction is very significant. If it has existed for some time the distended intestine can be seen above the obstruction, the sequence being a crampy colicky pain, visible peristalsis, stiffening of the intestine immediately above the obstruction and gurgling sounds like water and air in a bottle.

The patient will nearly always be able to locate the seat of obstruction as all the forces of peristalsis are endeavoring to pass the intestinal contents through it, which tends to develop a local tenderness. Fragments of tumor may sometimes be found in the stool and examined microscopically.

Tumors of the sigmoid may be divided into two classes, benign and malignant.

The most common malignant tumor is the ring-like carcinoma producing a distinct constriction resembling a napkin ring. On superficial examination this constriction may be taken for a cicatricial stricture on account of its small size. Adeno-carcinoma, however, is quite common, projecting as fungous masses into the lumen of the bowel, spreading early to the peritoneum and contiguous parts. It is this latter growth which so often necessitates resection of loops of neighbouring intestine or a part of the bladder on account of adhesions.

Sarcoma of the sigmoid is a rare tumor. We have seen several of the stomach, two of the cœcum but none of the sigmoid, although such cases have been reported.

The more common of the benign tumors are tuberculosis and diverticulitis. Tuberculosis in the sigmoid is not so frequent as it is in the cœcum; it may be either of the hypertrophic or the ulcerous type. The hypertrophic form is rare, but if present will give rise to a well defined tumor. The ulcerous type is often multiple and usually not suitable for operation.

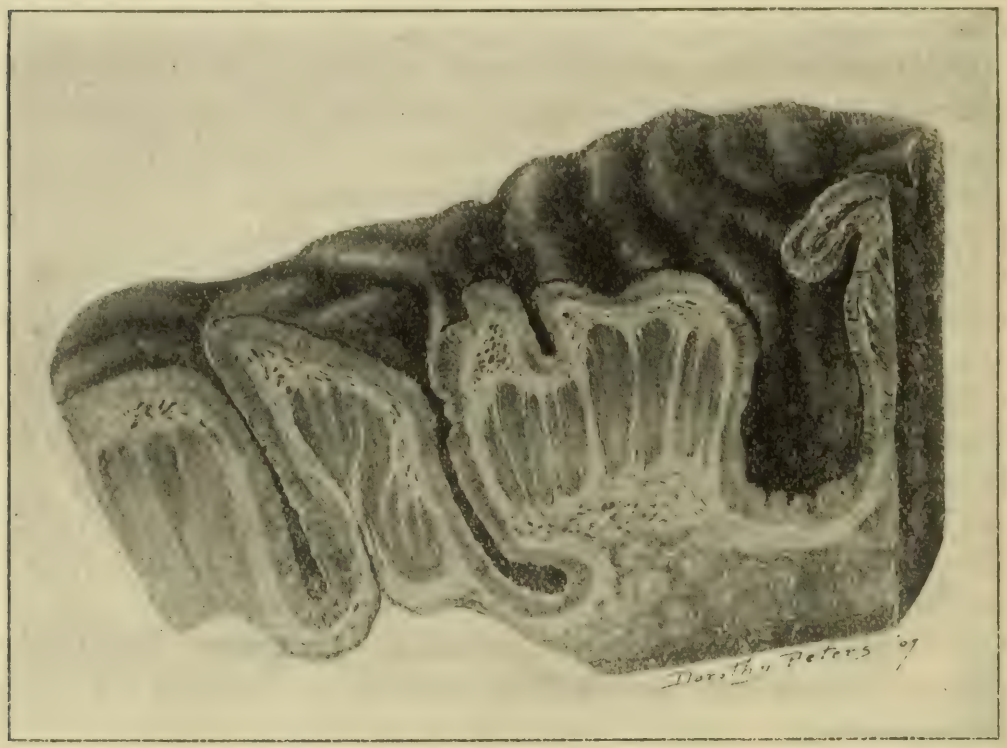
Diverticulitis (Fig. 1) is an interesting condition and has not been described surgically until within the last few years. Although these little pouches of mucous membrane projecting between the muscular coats have been known to exist anatomically, evidence as to their etiological relationship to certain tumors of the sigmoid of inflammatory origin, has been slow in developing. Diverticulitis is apt to be confused with malignant disease even after its removal unless careful microscopic examination is made; the inflammatory and cicatricial mass resembling cancer macroscopically. In one of our cases of resection for cancer of

the sigmoid, the malignant process began in a diverticulum which contained a fæcal concretion. The specimen, however, showed diverticula which were quite free from cancer; illustrating the influence of chronic irritation in the production of the carcinomatous process.

Fibro-lipoma in the wall of the sigmoid is occasionally met with. We have had one such case which caused intussusception. Polypoid growths (adenoma) of a non-malignant character are not uncommon. On two occasions we have removed such growths through the sigmoidoscope with a snare, and once, by the transperitoneal method.

Giant colon or Hirschsprung's disease, and volvulus especially in its subacute form, give rise to gaseous tumors of the sigmoid, but of course are not true neoplasms.

Surgical considerations.—Access to tumors of the sigmoid is best obtained by incision through the left semilunar line unless the distal part



Diverticulitis of the sigmoid, showing several pockets.

of the intestine is involved, when a median incision is preferable. If a tumor is supposed to be malignant, a thorough examination should be made before operation to show that the lymphatics and local involvement are not beyond the possibility of removal, and in order to ascertain if the liver is free from metastasis. It may happen that the enlarged gland, if present, will be inflammatory rather than malignant.

Even if one or more coils of small intestine, or the wall of the bladder,

the uterus, ovaries and tubes are adherent to the sigmoid tumor, the case will not necessarily be hopeless. We have had permanent cures after resection of two separated sections of adherent small intestine as well as after resection of part of the wall of the bladder, and on several occasions we have coincidentally removed the uterus with the ovaries and tubes because of its involvement in such growths.

Benign tumors of the sigmoid give far greater latitude for operation than malignant growths. Diverticulitis and tuberculosis are, however, extremely liable to be complicated with intestinal or bladder fistulæ, which adds greatly to the difficulty of removal.

The most important technical feature to be considered in the removal of tumors of the large intestine, concerns mobilization. The large intestine has a long mesentery in all of its parts, although in certain situations, such as the ascending and descending colon, and iliac sigmoid, the outer leaf is very short and acts as a supporting peritoneal ligament. As this outer attachment contains no important structures, we have merely to incise it, lift the colon from its bed and draw it to the midline on the inner leaf of its mesentery which contains the nerves, blood vessels and lymphatics. In this simple way the resection is made with ease. In mobilizing the sigmoid it should be remembered that the left ureter is adherent to the peritoneum which forms the inner leaf of the sigmoid mesentery just after it crosses the common iliac artery, and it should be identified and separated at an early stage of the operation.

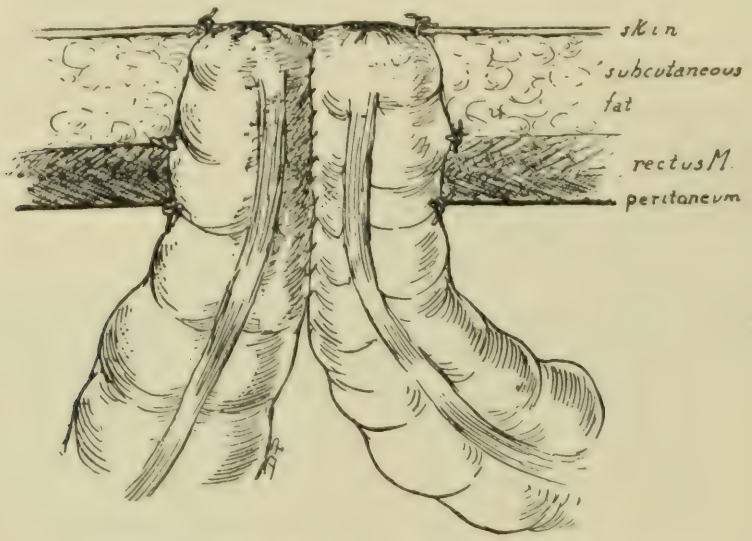
The next step in the operation concerns securing the blood vessels at their origin, especially in malignant disease. By raising the loosened sigmoid one can see the vessels where they rise from the inferior mesenteric on its inner mesenteric leaf, and catch and tie them. If necessary the inferior mesenteric itself may be caught and tied at its origin from the abdominal aorta. After dividing the vessels the entire mesosigmoid with the fat and gland-bearing fascia can be lifted cleanly from the posterior abdominal wall and removed with the intestinal growth.

If the patient is in good condition, the bowel not seriously damaged and both segments well covered with peritoneum, we practice primary resection and make an immediate end-to-end anastomosis. If the peritoneum is partly absent, as in the iliac sigmoid, a long lateral anastomosis is made not less than four inches in length, or occasionally an end-to-side union is made. As long as a large opening is secured the clinical results of these methods are equally good.

Occasionally a suture anastomosis looks unreliable, as though leakage might occur. If so, the intestine at the site of the union should be attached by a few sutures to the peritoneum in the bottom of the ab-

dominal incision, and some pieces of rubber tissue introduced making drainage to the surface, as a precautionary measure.

How shall we handle the intestine should there be much obstruction? In our experience, changes in the wall of the intestine caused by obstruction and leading to suture perforations some days after operation, has been the most common cause of death and it is almost an axiom in surgery never to resect an obstructed large intestine, even if the obstruction is moderate without employing protection against leakage, and when in doubt it is best to do a temporary enterostomy and resect later. In moderate chronic obstruction, we have found it advantageous to empty the distended colon by means of Monk's tube, resect and unite by the lateral method and finally fasten the site of the resection so as to leave it exposed in the wound after the Bloodgood method. If perforation then occurs it will be external. (See Fig. 2.)



Lateral anastomosis after the Bloodgood method.

A very good method is to bring the part of the intestine containing the obstructing tumor outside, and complete the operation as the first-stage of the Miculicz-Paul three-stage procedure. While we do not make use of this three-stage operation to the extent we did some years ago, in selected cases it gives excellent results. Until the tumor is thoroughly mobilized and the vessels divided, the technique is the same as in the usual method but instead of cutting the tumor away the two limbs of the intestine are attached to each other by sutures at a healthy point, and if it is more convenient, a separate lateral incision is made in the abdominal wall just long enough to enable the extrusion of the tumor. A few sutures on the inside attach the bowel to the peritoneum leaving the diseased sigmoid wholly exposed.

If it is necessary to relieve the obstruction immediately, the distal end of the gut caught with a clamp and the bowel divided half an inch beyond the skin and sterilized with the actual cautery at the mucous exposure. The proximal end is then caught temporarily in clamps an inch and a half beyond the skin incision. The entire tumor and attached intestine is cut away and a glass drainage tube with a flange or Paul's tube is passed into the proximal end of the bowel and tied tightly to hold in place. A rubber hose is attached to this drain carrying the intestinal contents into a convenient receptacle. If there are no immediate symptoms from the obstruction the tumor is not removed at once but is covered with a piece of rubber tissue and allowed to remain projecting externally until firm adhesions are formed. It is cut away on the second or third day leaving the proximal and distal ends of the intestine projecting from the wound like a double-barrelled shotgun. The final stage of the operation is then completed, on from the fourteenth to the eighteenth day, by passing a pair of strong clamps one blade down each intestinal lumen for three and a half to four inches, grasping the opposing walls of the intestine where they have been previously fixed by sutures. These clamps are left in position until they bite out the partition wall between, restoring the lumen. This usually takes place in from four to six days and the external opening gradually contracts and closes.

In acute obstruction with the patient in a serious condition, primary resection has an almost prohibitive mortality. After locating the tumor in these cases, a temporary colostomy is the wisest plan. Barker recommends a temporary ileostomy making a transverse incision in the ileum, introducing the tube and then fastening the ileum to the incision like a gastrostomy. In any event the enterostomy should be made at a point as remote as possible from the future operating incision.

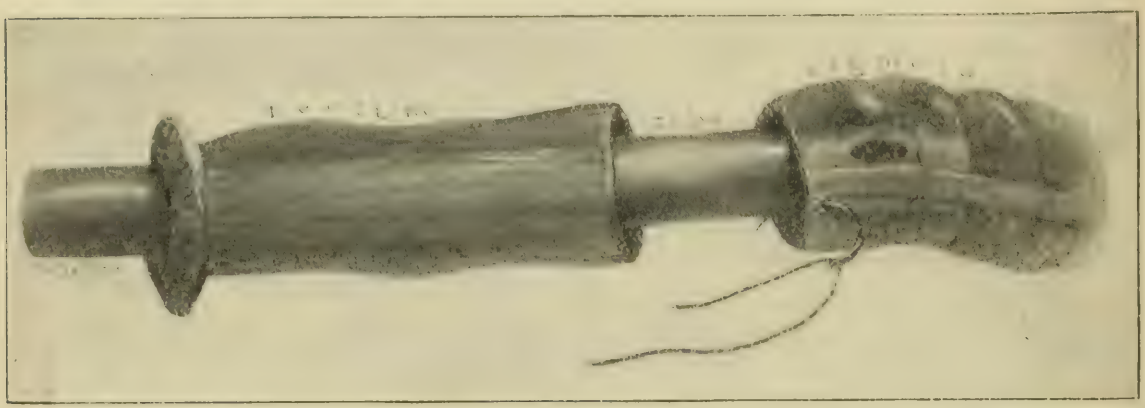
Tumors of the distal end of the sigmoid are most difficult to remove. If possible an end-to-end anastomosis is made with the rectum, but as the rectal end is devoid of peritoneum, union is unreliable. It may, however, be aided by passing a three-fourths inch rubber tube with a lateral opening through the anus and rectum to a point three inches above the cut end and fastened in this position by a lateral catgut suture (Fig. 3). An assistant draws on the end of tube projecting from the anus until the cut ends meet. Interrupted catgut sutures unite end-to-end, the operator taking pains to accurately coapt the mucous membranes. The rectal tube is then again pulled upon until a one-half inch intussusception is produced, and a second seromuscular row of sutures is inserted. The tube is left in position for four to six days, coming away after the catgut has been absorbed (Fig. 4).

Occasionally a combined abdomino-perineal will be the best method,

the colon being brought down and attached to the sphincter muscles. In fleshy males this procedure is most serious, and in two such cases we successfully employed the posterior route with the parasacral incision removing the coccyx.

In bleeding tumors with marked sepsis in the female we have made the Quenue-Tuttle perineal resection of the rectum and lower sigmoid with great satisfaction.

In operating upon the sigmoid the bowel should be emptied 48 hours before operation and allowed to become quiet, as recommended by Hochenegg. This precaution is useful in two ways: First, the colon germs are very active in liquid stool and the mechanical difficulty of securing careful asepsis much greater than if the fæces are solid or semi-solid. Second, if the bowel is brought down and attached to the anal muscles the projecting end can be left completely closed from two to



Showing rubber tube passed through rectum into upper portion of sigmoid and fastened in place by catgut sutures.

eight days, often until complete primary union takes place. During this period of complete obstruction the patient should be nourished with strained soups and albumen water.

Results of operation for the relief of cancer of the sigmoid are very good. At the present time the immediate mortality is from three to ten per cent., depending upon the condition of the patient, and at least one-half of them can be expected to remain cured.

Thirty-four patients with sigmoid cancer have been subjected to resection of the sigmoid with the following results.

CANCER OF THE SIGMOID.

Number of cases	34
Male	22
Female	12
Age of oldest	71

Age of youngest	31
Average age	52
Patients of ages between 30 and 40	5
Patients of ages between 40 and 50	8
Patients of ages between 50 and 60	10
Patients of ages between 60 and 70	9
Patients of ages between 70 and 80	2
Average duration of symptoms ....years	2
Operative mortality (13 per cent.)	5
Patients dying 1 year or less after operation	3
Patients dying 1 to 2 years after operation	5
Patients dying 2 to 3 years after operation	1
Patients alive and well 1 year after operation	10
Patients alive and well 1 to 2 years after operation	5
Patients alive and well 2 to 3 years after operation	2
Patients alive and well 3 to 4 years after operation	3

The prospective opening of the Queen Alexandra Sanatorium at Davos for the reception of patients early in this autumn was announced from the chair at the sixth annual meeting of the Council, held at 11, Chandos Street, Cavendish Square, W., on July 16th, by the President, the Lord Balfour of Burleigh, K.T., P.C., who has laboured so long and successfully in the difficult task of raising funds. A splendid donation of £25,000 lately received from a munificent sympathizer, who desires that his name shall not be published, not only supplies the amount required to complete the work and to open the sanatorium free from debt, but provides means for its scientific equipment and for future extensions. It should be mentioned that Lord Strathcona, with his well-known zeal in the promotion of all charitable and useful works, not long ago gave a donation of £2,000 for the purposes of the sanatorium. For the present the sanatorium will accommodate 54 patients, all in single rooms. But the public rooms are designed for a full complement of 120 patients. The Davos Invalids' Home, the original foundation of the late Mrs. Lord, which for so many years was the only representative of our national charity in Davos, has now ended its task and fulfilled the purpose for which it was initiated—that of developing into a National Sanatorium. The Home had been granted Her Gracious Majesty's patronage as far back as 1899.

PARASITOLOGY.

BY

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Mr. President and Gentlemen:—

It is not the purpose of this paper to present to you some recent advance in our knowledge concerning any one parasite; its object is to insist upon the importance of animal parasites as producers of disease and to quicken your interest in them by showing that parasitology has led, and is still leading, to the discovery of facts of great value in the everyday practice of medicine.

Many common diseases, occurring in Canada, in men and animals are produced by infection, by living pathogenic agents. In most cases the agent belongs to the vegetable kingdom: consequently, a knowledge of the part played by bacteria and fungi in the causation of disease forms an important part of the mental equipment of a physician. Until recently animal parasites occupied a very insignificant place in the study of pathology and, save for a few worms, they were unthought of as possible pathogenic agents.

Pasteur's discovery of the world of germ life initiated a great research movement which sought for a living, infecting cause in every disease. Since the bacteria are by far the most numerous and the most easily detected pathogenic agents, it is only natural that they have been particularly well studied. Because of the enormous number of maladies which are produced by them, it was, indeed, at one moment, almost tacitly assumed that only bacteria could produce disease. As a result, several bacteria were described as the cause of malaria, and Laveran's belief that an animal parasite—a protozoon—was the cause of that disease, met with very little acceptance when he proclaimed his discovery in 1880.

Although the importance of his announcement was unappreciated at first, it eventually—like the work of Pasteur—became the starting point of a great research movement. Many observers commenced to study malaria in order to confirm and extend Laveran's observations. Malaria is a disease which occurs especially in warm climates; consequently, those who studied it had an opportunity to observe other, little-known, tropical diseases. At that time the pathology of these diseases had been little studied; so it has happened that the last few years have seen an extraordinary advance in our knowledge of tropical diseases and of the part played in their production by animal parasites and by the patho-

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genic protozoa in particular. Today it is firmly established that low forms of animal life do produce diseases in living beings, all through the scale of existence, from the plants up to man.

It was not until 1898 that Ross, and those who followed him, described the method by which the malarial parasite is transmitted, through the bite of a mosquito, from man to man. Although Laveran made his discovery in 1880 and although it had been almost certain previously, that the bites of insects might transmit various diseases, it was not until the discovery of Ross was made public that pathologists fully appreciated that an animal parasite did cause one of the most important of human diseases and that it was transmitted from man to man by an insect; but once it was appreciated, many laboratory workers in all parts of the world turned their attention to this new field for research. In the eleven years which have elapsed since 1898, an enormous amount of energy has been expended upon the study of tropical diseases of all sorts and especially of those produced by pathogenic protozoa or transmitted by the bites of insects.

Through the accumulation of knowledge resulting from all this work, a new division—Animal Parasitology—has been made in the classification of Sciences. Chairs have been dedicated to it in several universities; papers without end have been written on it in every tongue and published in one of half-a-dozen journals which are devoted to it alone. Because of its importance in the practice of medicine in the tropics, Schools of Tropical Medicine have been established in Great Britain—where there are no less than three of them—in France, in Germany and in Belgium; Animal Parasitology forms a major part of the instruction in these schools. Only physicians who have taken the course, and won the diploma, offered by them are accepted by the governments of the countries concerned for service on the official medical staffs of their possessions in tropical climates.

Animal parasitology has done much to rob "climate" of its reputation as a producer of disease. It has shown that the unhealthiness of the tropics for Europeans is due not to meteorological conditions, but to the presence of parasites: that tropical climates favor the existence of these parasites is true; but heat, moisture, and miasmas do not in themselves produce the diseases formerly attributed to them.

A special training in animal parasitology is necessary for medical men, among other reasons, because special technique is required for the study of animal parasites. Of course, many of the methods employed in bacteriology are useful, but there is no doubt that much of the work done on the pathogenic protozoa has not been so fruitful as it might have been because it was directed by ideas acquired in a study of the bacteria. In

working with pathogenic protozoa, fresh specimens and specimens prepared by the most careful histological methods must be constantly examined, in the face of negative results, with a patience rarely necessary in bacteriology. Cultural methods are of comparatively little importance and at present the actual observation, with the microscope, of the things done by them is the most important of our methods of acquiring a knowledge of the pathogenic protozoa.

It is true that, up to the present, animal parasitology has done more to increase our knowledge of the diseases of tropical countries than of those which occur in temperate climates, but none the less it has afforded great advances in our knowledge of the latter. For example, syphilis has been shown to be due to an animal parasite, one of the protozoa,—the *Treponema pallidum*.

When the importance of the animal parasites as disease producers commenced to be appreciated, they were looked for in many of the diseases of which the causation was unknown; in many instances the search was successful and specifically pathogenic protozoa were found. There are, however, still many diseases, probably produced by infective agents, in which the nature of those agents remains unknown and even unsuspected (milk fever or trembles, the anæmias, onylai—an acute infection in Angola).

Bacteriology and cellular pathology made it evident that the diseases of men had everything in common with those of animals and that human pathology might learn much from a study of the disease processes in animals. These things have been particularly true of infections by protozoa and our practically useful knowledge of the protozoa, pathogenic for men, has been pieced together from observations made on protozoa, pathogenic and harmless, parasitic in insects, molluscs, fish, reptiles, birds and mammals.

In order to give some precision to the claims we have made for the importance of the animal parasites in the production of disease, let us consider the facts on which they are based. We will go over, first of all, the list of those maladies which have been shown, or are thought, to be caused by the unicellular animal parasites, that is, by the protozoa. (The multicellular animal parasites also produce important diseases, but it is impossible to even mention them in the limits imposed by this paper; consequently, we shall confine ourselves to a consideration of the pathogenic protozoa, a single division of the animal parasites.) Protozoa have been proved to cause the diseases of man mentioned in this paragraph. All the different forms of malaria are produced by one of the three varieties of malarial parasites which infect man. Two varieties of trypanosomes produce severe diseases in men in Africa

and in South America; one of these diseases is the frightfully fatal Sleeping Sickness. At least two species of the parasites called *Leishmania* are pathogenic in man: they cause the tropical sore known—among many different names—as Delhi boil and the invariably fatal Dum-dum fever or Kala-azar. That one form of dysentry and subsequent liver abscess is always associated with an amœba has been known for some years. Spirochætes cause at least two important groups of maladies; namely, yaws and the relapsing fevers; while to the closely allied *Treponema pallidum* is due one of the most dreaded of human diseases—syphilis.

In addition to these affections, where the pathogenicity of the parasites has been definitely proved, other human diseases exist in which the presence of protozoa has been described but their causal connection with the associated condition has not been proved, or else the lesions produced are comparatively insignificant or the condition is an exceedingly rare one. The following are instances of affections of this sort, which, consequently, have not been mentioned in the list of diseases proved to be caused by protozoa. Infusoria and certain flagellated protozoa have been described in connection with some types of dysentry: amœba and various ciliated protozoa have occurred in pus and body effusions: coccidia and certain other sporozoa have been seen in various positions in the tissue of the muscles and organs;—one of these, the *histoplasma capsulata,* has been described in Central America in connection with a disease somewhat resembling pulmonary tuberculosis; an unclassified parasite, certainly a protozoon, has been observed in an obscure febrile disease of men in North Africa.

Certain bodies have been described in constant connection with some diseases of uncertain causation; for example, the recognition of the bodies associated with hydrophobia and trachoma is practically diagnostic of these diseases. For various reasons, these bodies and appearances which are constantly seen in the exanthemata have been thought to be protozoa. *Molluscum contagiosum,* the fatal tick fever which occurs in Montana, typhus and yellow fever, as well as dengue fever and certain other fevers occurring in Japan and Southern Europe, are also thought, on more or less valid grounds, to be due to protozoa.

Just as there are many bacteria which inhabit the bodies of men and animals without producing disease, so there are protozoa which are parasitic in mammals without harming them. As might be expected, some of these harmless parasitic protozoa have been unjustly suspected of producing diseases with which they have been accidentally associated. For example, spirochætes, which are not infrequently seen in mice and

rats, have been described as the cause of experimental cancer in these animals.

Not the least of the benefits which have followed the wide-spread interest that has been manifested during the last ten years in the animal parasites, has been the collection of information concerning the geographical distribution of the diseases produced by them. Some of these diseases, formerly thought to be almost local, have been found to be distributed exceedingly widely. For example, Kala-azar—which was originally called Dum-dum fever after the name of the town in which it was observed first—has been found to occur almost everywhere in tropical and semi-tropical Asia, a disease practically identical with it occurs along the North Coast of Africa: the African human tick fever occurs in South America: trypanosomes have been found in cattle in Europe: in Canada, a widely spread and very serious cattle disease, characterised by hæmoglobinuria and caused by a piroplasma has been reported from British Columbia: in Alberta, sarcosporidia have been reported in cattle and horses and the fatal dourine, a disease produced by a trypanosome, exists among horses: trypanosomes have been found in wild rats and hares in Saskatchewan; the question naturally suggests itself whether the extraordinary periodical disappearance of hares through an epidemic of some nature may not be due to the presence of these parasites: and, lastly, there is much reason to believe that the fatal swamp fever of horses, which occurs in all of the prairie provinces, may be due to a protozoan parasite.

We have seen that the discovery that malaria is transmitted by a mosquito resulted in investigations which were carried on in all parts of the world; and these have shown that there are many diseases — in some of them the causative parasite is not known — which are transmitted from man to man by the bites of insects. Several of the protozoa transmitted by the bites of insects undergo a definite and necessary development within their invertebrate host before they are capable of being transmitted to their vertebrate host. Consequently, the fact that a disease is conveyed to a susceptible animal by a biting insect only after a definite period has elapsed since it fed upon an infected one is accepted as suggestive that the *causa causans* of the disease is a protozoon parasite.

The following list gives the names of human diseases transmitted by the bites of insects; when it is known, the parasite causing the disease is also mentioned: malaria is caused by one of the malaria parasites and is transmitted by a mosquito: yellow fever is transmitted by mosquitoes; its cause is unknown, but it is probably a protozoon: dengue fever is transmitted by mosquitoes; its cause is also unknown: it is suggested

that Weil's disease, acute infective jaundice, may be transmitted by the bites of mosquitoes: the trypanosome causing Sleeping Sickness is transmitted by the bites of tsetse flies: the South American trypanosome is transmitted by a bug related to that insect popularly known in this country as the "kissing bug": the spirochæte producing tick fever is transmitted by the bites of ticks; that causing relapsing fever very probably by the bites of lice and bed bugs: bed bugs are very possibly responsible for the transmission of kala-azar; it is suggested that they may also transmit typhus: a fever closely allied to dengue is produced in Southern Europe by the bites of one of the owl midges. Diseases not caused by protozoa which are transmitted by the bites of insects are plague, transmitted by fleas, and filariasis, transmitted by mosquitoes.

The ultimate object of the study of all diseases is evidently to devise means of combating them. Through the study of yellow fever and malaria, most efficacious methods of prophylaxis have been devised, by which these mosquito-borne diseases have been entirely suppressed in tropical districts, formerly heavily-infected by them. This has been done by destroying the mosquitoes which transmit the diseases. It is comparatively simple to do this, because during approximately ten days of their development sheltered collections of fresh water are absolutely essential to mosquitoes. By leaving no collections of water in which they can breed, these insects are absolutely destroyed and, since they are necessary for the transmission of these diseases, malaria and yellow fever do not occur where mosquitoes do not exist.

No such weak point occurs in the development of the tsetse-fly and it is impossible, by destroying it, to prevent the diseases caused by the trypanosomes it transmits. A good deal of work has been done therefore with the object of finding a drug which will be as efficient in the treatment of the trypanosomiases of men and animals as is quinine in the treatment of malaria. Although the results of this work have not been altogether satisfactory, yet drugs have been devised which are strongly trypanocidal. It is certainly possible to cure many cases of experimental trypanosomiasis in animals: and a certain number of human cases, which were treated early and vigorously, have probably recovered from what would otherwise have been a fatal disease. At all events, more is now known of the mechanism of the action of trypanocides in the treatment of trypanosomiasis than is known of the action of drugs upon the parasite producing any other disease.

When it became known that syphilis was caused by a protozoan parasite, it was thought that the drugs which had been found to be of value in the treatment of trypanosomiasis might also have an action in it. The experiment was made and it was found that certain trypanocidal

preparations of arsenic and antimony were of very distinct value in the treatment of both experimental and clinical syphilis.

The two following advances in the treatment of disease, which have also resulted from the work done on the therapeutics of trypanosomiasis, have just been published. It has been found that one of the trypanocidal organic compounds is able to cure canine piroplasmosis; the parasite causing this disease belongs to the same species as that which produces hæmoglobinuria in cattle. In spite of all attempts at treatment kala-azar hitherto has been an invariably fatal and steadily progressive disease; a few cases recently treated by "atoxyl" have apparently recovered.

In its growth our knowledge of animal parasitology is following the same order of development as did the study of bacteriology. In the earlier days of bacteriology, the description of the bacteria and of lesions they produce occupied most of the attention of laboratory workers; now, more time is spent on the study of the functions of bacteria and of the methods by which they produce lesions. Although much remains to be described and explained in the development of animal parasites, we are commencing already to learn something of their mode of action. Among the protozoa, in particular, it seems as though the investigation of the action and reaction between animal parasites and their hosts may afford results of great interest. So far as is known, an absolute immunity is rarely—if ever—acquired by a mammal against a protozoan parasite to which it is subject; but a comparative tolerance often exists between its host and a parasite which may produce in it a serious disease. This is shown by the following facts: adult natives in Africa may harbour malarial parasites for years without apparent symptoms; pathogenic amœba may be carried about for months in the intestine of apparently healthy persons without provoking signs of dysentry; persons living in parts of England from which malaria is absent may have attacks of malaria after a period of from three to seven years since they were exposed to any possible source of infection: cattle may harbour piroplasmata for years without any sign of disease: horses, cattle and game may have trypanosomes in their blood for years and be in apparent health although the trypanosomes from them are virulent when subinoculated into other animals. In each of these instances, the parasites have actually been shown to persist over long periods in apparently healthy animals; it is suggestive that in syphilis, also a protozoon-caused disease, similar periods of abeyance may occur in the progress of the infection. The similarity cannot be over-looked between these observations and those recently reported where bacterial disease has been spread through "carriers" of typhoid and other organisms; that is, by persons who, while apparently healthy, harbour infective bacteria.

For these reasons alone it may be stated to be probable that a study of the relative active immunity which may exist between a mammalian host and a potentially virulent, protozoan parasite may add to our knowledge of the mechanism of immunity.

In conclusion, let an allusion be made to a combination of facts which suggests an interesting field for investigation. Malaria kills a large proportion of the children born to primitive native races which inhabit malarious countries: the death rate is high among calves born in herds of cattle which thrive, in spite of a more or less general infection with trypanosomes (*Trypanosoma dimorphon*), in a country where the tsetse-fly (*Glossina palpalis*) exists; it is probable that the calves die from trypanosomiasis: yellow fever is also probably caused by a protozoan parasite; children born in a country where it is endemic acquire immunity to it by means of slight, clinically unrecognisable attacks.

In all three of these diseases the immunity enjoyed by adults is an acquired one; it is not racial because natives of tropical countries, born in localities from which yellow fever and malaria are absent, are just as susceptible to both as are Europeans; again, cattle die of trypanosomiasis. There is no permanent immunity against malaria for negroes because blacks who have lived for some years in Europe may suffer severely from that disease on returning to Africa. In malaria and trypanosomiasis the immunity is only relative, for while the general health of the host remains good there may be occasional attacks of slight, indefinite fever, unaccompanied by diagnostic symptoms; if the host be examined during these attacks, the causative parasite will usually be detected.

The sum of all these facts is that a relative active immunity may be acquired by some mammalian hosts against the diseases produced in them by certain protozoan parasites. The immunity is not a permanent one and it is associated with the presence of the parasites in the host. This infection finds its expression in the host by occasional attacks of indefinite fever, clinically unlike the affection usually produced by the parasite concerned.

Bodies have been described in small-pox, chicken-pox, measles and scarlet fever with the suggestion that they are protozoa. Be that as it may, these facts are certain. In temperate climates many children suffer from, and some succumb to, infection by one or more of these exanthemata; some persons may pass through life without having had obvious attacks of some at least of them; but all persons have suffered either as children or adults, or both, from indefinite febriculæ. It is suggested that some of these febriculæ, like the indefinite fevers produced in adult, relatively tolerant negroes by malaria, may be the expression of a con-

stant infection by the parasites producing the exanthemata and that through such mild and unrecognized attacks the immunity of some persons to these diseases can be explained.

Finally, the fact that the vaccine against small-pox is so successful suggests a hope that a further study of its mode of action and of the mechanism of immunity in infections by protozoa may be the means of suggesting equally successful means of preventing other diseases produced by parasites belonging to the animal kingdom.

MEDICINE IN CANADA.

BY

M. CHARLTON.

As the year 1832 marked a great advance in medical education in Lower Canada so it did likewise in Upper Canada. Especially was this the case in York (Toronto) where medical education was being zealously guarded and advanced by the Medical Board.

This Medical Board had been formed as early as 1818 by an Act of Parliament and it was within a year or two of its inauguration that it was successful in having the York Hospital started. About 400 acres of land had been set aside as early as 1817, by an order in council for a hospital.

In Dr. Scadding's "Collections and Recollections," he describes the hospital. "The old hospital was a spacious, unadorned, matter of-fact, two-story structure of brick, one hundred and seven feet long, and sixty-six feet wide. It had, by the directions of Dr. Grant Powell, as we have heard, the peculiarity of standing with its sides precisely east and west, north and south. . . . The building exhibited recessed galleries on the north and south sides, and a flattened hipped roof." There was then no asylum for the insane. Mrs. Jameson, who had hoped that an Act would have been passed in 1836 for the erection of a provincial lunatic asylum, writing at the time, says, "At present these unfortunate persons either wander about uncared for, or are shut up in jails. Instances are known of pauper lunatics straying into the forests, and perishing there. The fate of those confined in the prisons is not better; the malady is prolonged and aggravated by the horrid species of confinement... Dr. Rees has offered a block of land a few miles from Toronto for the site of an hospital or asylum for lunatics, but at present it seems the intention of the legislature to take the penitentiary at Kingston for an asylum, and erect another penitentiary on a different plan."

In 1824 this hospital was described as one of the largest buildings in the Upper Province, but by 1832 it was found to be too small, so rapidly had the little town of York developed.

It was in this same year that the students attending the hospital formed the "York Students Medical Society." A librarian was appointed and the sum of four dollars charged as an entrance fee to defray the expense and to assist in binding books for the society. Three years later the medical profession held a meeting at the hospital to form a medical library.

Some dissatisfaction seems to have been expressed by the citizens against the Board about the management of this Hospital. One of their complaints was that the said Board furnished no public reports of the Hospital.

The Board met quarterly for the purpose of examining those desirous of practicing medicine. From the lists which are given of those who passed and those who were rejected quite a number seem to have failed in satisfying the requirements of the Board. Among those who were examined were several from the McGill Medical College. These were granted their license.

In 1832 the Board issued a circular urging parents to see that their sons who intended entering medicine should have the best education obtainable, a strong point being made in favour of Latin.

Among other things the Board was interested in was that of hygiene, and they acted as the Board of Health for York. They waged warfare against the former crude methods of dealing with sanitary matters and urged the daily employment of scavengers. Unlike their confreres in Montreal they acknowledged the great superiority of the American cities in matters of sanitation.

Although the progress of York had been greatly retarded by the war of 1812 yet it continued to make such rapid strides that by 1834 it was incorporated as a city under its original name—Toronto. It was known by this name fifty years before Simcoe became its Governor. The name, Toronto, also occurs in some of the old French documents as early as 1686, and again in 1767, when Sir William Johnson mentions the name Toronto in a despatch to the Earl of Shelbourne and in 1788 the name is again mentioned by J. Collins, Deputy Surveyor of Canada. The name of York seems to have been given in honour of the Duke of York's victories in Flanders. From its incorporation as a city to 1844 the population was nearly doubled, there being 18,420 persons in 1844. From this rapid increase one realizes that the duties of the Medical Board were onerous.

Toronto now possessed a fine hospital, a bank called the Bank of Upper Canada, which had been opened in 1821, and the beginning of a University—King's College.

The project of a university for the town of York had been repeatedly urged upon the Home Government by Governor Simcoe. After a long and vehement debate for an endowed university the charter was sent over.

King's College was founded by a Royal Charter in 1827. "For the establishment at or near the town of York of a college, with the style and privilege of a university to continue for ever, to be called King's College, the chancellor, president and such professors of said college as shall be appointed members of the college council, to be members of the Church of England and Ireland, and they shall, previously to their admission into the said college council, severally sign and subscribe the thirty-nine articles of religion, as declared and set forth in the Book of Common Prayer". This college had the style and privileges of a university and was endowed by the King with 225,914 acres of land.

In after years amendments were made to the charter, which had been modelled after the English universities and which proved too exclusive for a young country. At a meeting of the Medical Board in 1837 they protested against the action of the governing body of King's College in not appointing any members of the medical profession.

There were now in Upper Canada two public hospitals, one in Toronto and the other at Kingston which was built in 1835. This latter hospital was of four stories and had beds for about 120 patients. Previous to this there had been a military hospital for the use of the garrison stationed there. During the war of 1775 it was used by Sir John Johnson as a place of storage for Indian presents. In 1790 the place was again used as a military hospital. The first classical school in Upper Canada was started at Kingston about 1785 by the Rev. John Stuart, and the first literature printed in Upper Canada was a novel at Kingston in 1824 called "St. Ursulas Convent," this was followed by a short poem published in 1826.

Stages from Montreal to Kingston began running in 1808 and from Kingston to York in 1812, but the only means the inhabitants of the Upper Provinces had of sending their wheat and other products to Montreal was by the bateaux, an extremely difficult and often dangerous voyage. The road from Toronto to Kingston had been begun by Governor Simcoe and after some years was finished by the Government.

Mrs. Jameson in her book on "Winter Studies and Summer Rambles in Canada," gives a vivid description of a journey in one of these stages and the awful state of the roads. One has only to read the description given by early writers to realize the difficulties the western people had to contend with in forming a connection either by land or water with

Montreal. In navigating Lake Ontario and the St. Lawrence River they employed 800 Durham boats and 1,500 bateaux.

In spite, however, of these drawbacks the early settlers were enthusiastic agriculturists, and as early as 1792 an agricultural fair was held at Newark (Niagara). Simcoe, who was then at Newark, encouraged the settlers in every way to study this most important branch. It was owing to his care that fairs and premiums were beginning to assume their place as part of the life of these settlers. In 1793 Simcoe offered ten guineas as a premium to the Agricultural Society of Upper Canada, as well as a copy of "Yonge on Agriculture," besides a number of other books from his own library, to encourage reading on the subject. Books were very scarce at this time, especially in Upper Canada, and frequently the only books to be found in the cabins were "Elliot's Medical Pocket Book" or "Recketson on Health."

From these early beginnings we find that by 1830 Upper Canada had become renowned as an agricultural country and in that year the Legislature passed an act "to encourage the establishment of Agricultural Societies in the several districts of the Province." When the people were able to subscribe a certain sum of money for these societies, the Government assisted them with a sum of one hundred pounds and upwards. In the wording of this act—"to encourage the establishment of Agricultural Societies," it might have read to encourage the said societies already formed as early as 1793 in Ontario. These societies paid especial attention in 1825 to importing a pure bred stock.

Upper Canada was favoured by Scotch immigrants on account of the inducements for agriculture, which were greater than elsewhere. As many as fifty thousand English, Scotch and Irish immigrated to Upper Canada from the years 1830-2.

In spite of the political agitation which disturbed the country previous to 1837, there was found to be in 1838 nearly a million and a half of dollars in the Upper Canadian banks. Toronto, Kingston, London and Hamilton were pushing ahead. By-Town (Ottawa) had its Rideau Canal in course of construction.

To show that quackery still flourished, there was published in Hamilton in 1832 by Samuel Thomson, a book with an astonishing title called, "New Guide to Health, or Botanic Family Physician, containing a complete System of Practice upon a plan entirely new, with a description of the vegetables made use of and directions for preparing and administering them to cure disease." His stock in trade consisted of about thirty vegetable preparations, and in time he had quite a number

of followers and these Thomsonians seemed to have practised regardless of the law. Their name was afterwards changed to "Eclectics."

As Mr. William Canniff's work "On the Medical Profession in Upper Canada," 1783-1850, is so well known to the medical profession we have only touched on some of the leading events in Upper Canada previous to 1837.

THE VON PIRQUET TUBERCULIN REACTION.

BY

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In a recent paper Baldwin, dealing with the von Pirquet reaction, states that he considers the cutaneous tuberculin reaction to be preferred to all others, and that only in cases of failure should recourse be had to the subcutaneous method.

The von Pirquet reaction, although perhaps not so easy of application and interpretation as the ophthalmic, is free from danger to the patient, and can be used in cases where the subcutaneous reaction would be of doubtful value or could not be applied.

To attempt to discuss the cause of this reaction and to enter into a discussion upon it is hardly the purpose of this paper, still a short review of some of the theories that have been advanced in explanation of the reaction would not, I feel, be out of place.

We are all familiar with the fact that the injection of a bacterial vaccine, while it may produce little or no effect in a normal individual, causes in the infected a depression in the opsonic content of the blood, the so-called "negative phase" of Wright. This blood change we have been able to approximately measure by means of the opsonic index, and we have seen that the drop in the opsonic power may be accompanied by marked constitutional symptoms, such as fever, malaise, etc. We have also observed at this time a local reaction at the site of injection.

Since Koch first described the effect of injections of killed cultures of the tubercle bacillus upon tuberculous animals, and as a result of his observations introduced the product, old tuberculin, for diagnostic and therapeutic purposes, many theories have been advanced to explain the phenomenon which is known to us all as a tuberculin reaction. Koch's own explanation was that the tubercle bacillus produced a toxin, which diffused into the surrounding tissues and there in concentrated form produced its most pronounced effects of coagulation necrosis and caseation, and that this necrosed tissue was surrounded by tissue upon which the now weakened toxins were not strong enough to produce necrosis.

Consequent to the injection of a dose of tuberculin, the added toxin, (for he considered tuberculin to contain toxin), permitted a further local and rapid spread of the necrosis, accompanied by constitutional symptoms.

Now there is good evidence to show that tuberculin does not contain specific exotoxin, and further we know that tuberculin does not produce necrosis, although under certain conditions it may lead to tissue change.

The tuberculin reaction is held by von Pirquet, Schick, Rosenau and Anderson, and others to be analogous to anaphylaxis, the tissue reaction of sensitized animals to a second injection of horse or other serum. In the case of tuberculin reaction, the infection takes the place of the first or sensitizing dose of serum and the injection of tuberculin corresponds to the second injection of serum. Von Pirquet's theory with reference to the early reaction to vaccination after small-pox, would not be out of place here and possibly has an important bearing. This author believes that the result of an infection is to bring about a change in the way the tissues react to a second infection by the same organism. He calls this altered tissue state "allergie." This may lead to hypersensitiveness or to temporary immunity, and is followed by a condition in which infection may occur but is combated by the formation of anti-bodies at the region of inoculation more rapidly and more easily than normally. Baldwin in this connection says that "revaccination is without result in the previously vaccinated child, because the virus fails to develop in the face of the prompt reactive inflammation which soon wears away. . . . We cannot interpret the local tuberculin reaction in any other way."

According to Marmorek tuberculin stimulates the tubercle bacillus to the production of a toxin, which he presumes can take place in the infected animal; this gives rise to local reaction and to the general systemic reaction of fever, etc. He does not regard tuberculin as containing toxins of the tubercle bacillus.

Bail's theory of aggressin, Wasserman and Buck's complement fixation theory, and the above theory, can hardly be deemed conclusive, although they are of importance, and if time permitted might have been considered at length.

In this series of cases in which the reaction of the skin to tuberculin was tested, no particular type of case has been sought after, the cases have been taken as the requirements demanded, and the observer did not know in many instances the nature of the case he was dealing with.

Some of the cases subsequently came to autopsy, while others were operated upon and the diagnosis confirmed one way or another. Some errors have been made, and some of the readings may be open to question. Still, as a whole the results have been fairly regular.

While I admit that something may be gained by the use of various strengths of tuberculin, still, for purposes of comparison and to establish, if possible, for my own satisfaction, a reasonable standard of reaction, I considered that the use of a constant strength solution of old tuberculin would give the best results. Nor does the use of a constant strength tuberculin exclude comparison between the various grades of infection, for, if anything is to be gained from the intensity of the reaction, a fifty per cent. solution of old tuberculin will show all grades of reaction and conclusions may be drawn with more and more accuracy as experience increases. There is no doubt that there is some confusion as to the reading of the reaction and I must confess that it is sometimes rather difficult to arrive at a definite conclusion in the doubtful cases.

The method of procedure has been as follows. After the skin of the upper arm has been cleaned and disinfected, three minute scarifications, about two centimeters apart, are made one below the other, care being taken not to draw blood. A drop of fifty per cent. old tuberculin is then placed on the upper and lower scarified areas and a drop of water containing ½% formalin on the central area.

With a sterile glass rod the tuberculin is then rubbed into the upper and lower areas and with another rod the solution of formalin is treated in a similar manner. The areas are allowed to dry and a sterile dressing applied. The arm is examined in twenty-four hours and the result considered positive or negative on the presence or absence of the following signs: redness, vesication and induration.

A typical reaction would at this time have the following appearance. A centre of deep red colour showing minute papules, outside this a zone of lighter colour, sometimes yellow, and surrounded by an area of hyperemia, the whole being well indurated. The typical and positive reaction is always accompanied by hyperemia, but we frequently get pseudo-reactions which exhibit superficial redness and which are not accompanied by induration, and further, it is only in the very marked reactions that there is any considerable tendency to vesication. Redness then by itself does not constitute a positive reaction with a 50 per cent. solution of old tuberculin, there must be accompanying papulation, and induration. It is this induration, which in the typical reaction, by pressure on the capillaries of the skin, causes the yellow or paler area around the scarified area.

The cases in this series have been divided into four groups.

Group I.—Cases which showed definite evidence of tuberculosis or showed a tuberculous lesion at autopsy, 52.

Group II.—Cases which did not show any clinical or other evidence of tuberculosis, 27.

Group III.—Cases indefinite as to diagnosis, 14.

Group IV.—Seven cases of pleurisy with effusion, 7.

Group I includes in all fifty-two cases which showed definite evidence of tuberculosis of which nine gave a negative reaction. These negative cases were:—One case of tuberculoma of the cerebellum which came to autopsy, two cases giving the typical clinical picture of tuberculous hip disease, one case of tuberculous arthritis, one case of tuberculous spondylitis, two cases of advanced pulmonary tuberculosis, one case of extensive tuberculous peritonitis, which came to autopsy, and one case of tuberculous meningitis in which the tubercle bacillus was demonstrated in the fluid drawn by spinal puncture.

Of the nine negative cases four were cases of advanced tuberculosis, that is, they were of the type of disease in which reaction to tuberculin is not generally obtained. They were also cases which could be easily diagnosed clinically. This group then shows five other cases of tuberculosis which did not react to the test.

Group two numbers twenty-seven cases which did not show any clinical or other evidence of tuberculosis and in no case was a positive reaction obtained. This group would be of more value if the number of cases had been greater, but as far as it can be used it is satisfactory and shows that the reaction according to this method of application and reading is fairly reliable.

Group three, which includes fourteen cases indefinite as to diagnosis, is perhaps not so satisfactory. Four of these fourteen cases gave a positive reaction. They were one case of chronic colitis and three cases of irido-cyclitis.

The negative cases were, one case of indefinite glandular enlargement which clinically did not look tuberculous, and one case of suspected tuberculoma of the cerebrum which is probably tuberculous, but is not definitely so.

I find this the most difficult group to comment upon and I must admit that it is hard to draw definite conclusions from the results. With, however, the results of group one and two before us in which we see an error of only 10% as regards group one, and in which group two presents uniform results, I feel that the results in the cases of this group are approximately correct and have consequently been of considerable value as an aid to diagnosis.

Group four which consists of seven cases of pleurisy with effusion, all of which gave a negative reaction, is of considerable interest. These

cases may have been tuberculous and it is noticeable that no reaction was obtained. They have therefore been placed in a group by themselves and not under group one as negative cases.

It has been previously commented upon that cases of tuberculous disease with serous effusion do not in all cases react typically to tuberculin, and it is possible that, as regards the skin reaction, the type of case included in this group shows a similar variability.

To sum up I have found that of a hundred cases examined there have been 47 cases which have given a definite and positive reaction.

Of these cases 43 showed definite evidence of tuberculosis or showed a tuberculous lesion at autopsy, and four were cases indefinite as to clinical diagnosis.

Twenty-seven cases without evidence of tuberculosis were negative. Five cases of tuberculous disease in which a reaction might have been expected, did not react, and fourteen cases indefinite as to diagnosis reacted variably. Of these fourteen cases four were positive and have already been included in the recapitulation, and ten were negative.

By adding these ten negative cases, which it must be remembered have not been shown to be tuberculous, to the five tuberculous cases which were negative to the reaction, we have in all 15 cases which we might call tuberculous and which were negative to the reaction. This gives the highest possible estimate of error.

On the other hand we have the four indefinite cases which gave a positive reaction.

We see then that in this series of cases the reaction to tuberculin by the cutaneous method, when carefully carried out and interpreted, is not so common as we have been led to suppose by the reports in the literature, for, of one hundred cases examined only forty-seven gave a positive reaction, which figure is only a little above the estimated incidence (43.7 per cent.) of tuberculosis, according to McCrae, in the city of Montreal.

THE OCCURRENCE OF ADVENTITIOUS SOUNDS IN THE NORMAL CHEST.

BY

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Perhaps it would be better to entitle these notes the frequent occurrence of slight degrees of collapse in apparently healthy chests.

It is usually considered and taught that in auscultating the normal chest nothing should be heard of the respiratory tract but the breath sounds and the vocal resonance,—in other words there should not be any adventitious sounds present. And as a rule this is true. In many chests, however, if one listens carefully, especially during a full inspiration, there may be heard fine or even medium crepitations, and this when there are no symptoms or signs of anything organically wrong with the respiratory tract.

The most common situation in which these crepitations may be heard is in the little point of the left lung that lies immediately posterior to the cardiac notch, i.e., immediately behind and below the normal apex beat, but they may often be detected almost anywhere along the edges of the lungs, and especially at the bases behind. They are perhaps more common in children than in adults, but there is not much difference in this respect. They were heard recently in about one-third of all the children in the Children's Hospital who were free from signs of respiratory disease. Many of these children had been long in bed with hip, joint and other chronic surgical affections.

There seems to be wonderfully little reference in medical literature to these sounds considering how often they occur. A few authors mention that crepitations may be heard at the bases behind in weak people long bed-ridden. Thus H. A. Hare [1] says that "care should be taken that the fine crepitations sometimes heard in the chest at the bases behind in a person who has been long in one position in bed are not thought to be indications of pneumonia," and F. C. Shattuck [2] mentions such fine crepitations heard at the bases behind in people who have been long lying down, and says that they clear up on deep inspiration and are due to the unfolding of partially collapsed lung. Dr. Thayer, last May, at a meeting of the Association of American Physicians, in discussing one of the papers mentioned that he had often noticed crepitations in apparently normal chests and he thought that they altered with posture. Most, if not all, of the writers refer to such sounds as occurring in weakly if not

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long bed-ridden people but they may frequently be noticed in out-patient and office practice in the apparently healthy and surely clinicians must subconsciously ignore them, as they are often too evident.

As to the nature of these sounds, it seems probable, as Shattuck mentions, that they are due to the unfolding of partially collapsed lung. That such may produce crepitations may be shown by the following experiments: 1. The lungs were removed from the body of a man who had died four hours before of malignant disease of the stomach with rupture into the peritoneal cavity. A tube was inserted into a bronchus and the lung was blown up while an observer auscultated over the lung. As the lung expanded a rush of fine and even medium crepitations were heard exactly like those that occur during life.

2. The same experiment was repeated, using the lungs of a young man who while in perfect health had been suddenly killed by a heavy object striking the head. The same crepitations were equally well observed.

3. A rabbit was chloroformed and the lungs immediately removed and treated in the same way and with the same result. Here the alternate expansion and collapse of ordinary respiration were imitated through the tube in the trachea and the crepitations were audible on both inspiration and expiration, but very much so in the former.

In ordinary quiet breathing, and many people breathe in no other way for long periods of time, only about 300 cubic centimetres of air, the so-called "tidal air," enter and leave the respiratory tract. If the individual likes he can inspire about 1,600 c.c. more than this. It follows that during quiet respiration a good deal of the lungs is not fully expanded. When this expansion occurs while the lungs are being auscultated the same cracklings are heard as were heard in the above experiments. Laennec [3] in describing moist crepitations well likened them to "the sounds produced by blowing into a dry bladder, or still more like that emitted by the healthy lungs when distended by air and compressed in the hand strongly." As above shown, similar sounds may be produced during the distension, and this more nearly represents what actually occurs.

Very often crepitations occur at the bases in weak people due to œdema, but such are of a very different nature and significance to the ones here described and they will not clear up with the same ease that those do which are due to partial collapse.

The recognition that such adventitious sounds may occur in practically normal chests is sometimes of value. This value consists chiefly in recognising that they are not of serious import. The sounds are, of

course, heard best with a phonendoscope, but may be readily detected with an ordinary stethescope.

The location of these sounds, chiefly along the edges of the lungs, and especially just behind the cardiac notch; the fact that they readily clear up upon full respiration; the absence of causes of œdema and finally the absence of all symptoms and signs of respiratory disease usually make it an easy matter for one to recognize their true nature.

It would seem wise that people in whom such sounds are heard should be instructed to take regular breathing exercises.

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I. H. A. Hare.—Practical Diagnosis, page 272.
II F. C. Shattuck.—Auscultation and Percussion.
III. C. M. B. Camac.—Epoch making contributions to Medicine and Surgery and the allied sciences.

A SPONTANEOUS SEROUS CYST FLOATING FREE IN THE ANTERIOR CHAMBER.

BY

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CASE REPORT.

On the 6th of December, 1905, Miss L. C., 21 years old, came to the Ophthalmological clinic at the Hôtel-Dieu. She complained of ocular fatigue at her work, dress-making, and called attention specially to her right eye, which was weaker than the left.

Present Condition.—Examination of the left eye in oblique light showed a slight pannus on the superior part of the cornea. Save for certain granulations in the cul-de-sac of the upper lid, the rest of the eye and its adnexa were perfectly normal.

More interesting was the condition found in the right eye. The first striking observation was the presence of a small cyst in the anterior chamber. The tumour was not perfectly round, but rather flattened in the antero-posterior direction, and measured about two and a half millimetres in its widest, and one and a half in its narrowest diameter. It was transparent, and a careful examination with Hartnack's glass allowed us to see that its capsule was greyish, dotted with pigmented spots, and traversed by small muscular fibres in the form of brown ramifications. The most remarkable feature in the case, which is perhaps unique, was that the cyst had no pedicle, but was entirely free in the anterior chamber. In fact, if the head of the patient was thrown forward quickly, the cyst could be seen to move upwards. The examination of the cornea

showed small opacities, as well as a slight pannus. The posterior part of that membrane was transparent and had undergone no change from its contact with the cyst. No trace of traumatism, or of perforation was present. The fluid of the anterior chamber was clear, and the iris was of the same brown color as that of the left eye. The iris bore well the frictions of the cyst-wall, and showed no inflammatory reaction. Contraction to light was normal, and there were no synechiæ. Dilatation was normal, and was not influenced by any reflex irritation. No pupillary membrane was present. The lens was perfectly transparent and the anterior lens-capsule had no pigmented areas.

After instillation of homatropine and cocaine the fundus of the eye was examined and found normal. Ocular tension was not increased. Examination of the upper lid showed a slight trachomatous infection.

The refraction gave the following result:

R.E. + 1 — 3.75° V = 1/3
L.E. — 0.50 30° V = 1

Perception of color in both eyes was perfectly normal, as well as the fields of vision and the accommodation. There was no muscular asthenopia.

Personal History.—The patient said that one morning in January, 1898, she had noticed for the first time the presence of a small tumor in the right eye. The cyst caused no pain, and nothing else was noticed on that day any more than previously. Since that time, it had not increased in size and always preserved the same shape. The patient had not been incommoded by any inflammatory lesion caused by the tumour. She complained that on resuming the upright position after having bent her head forward, her right field of vision was obscured during the space of a few seconds. No history of ocular trauma was obtained. The patient was not the subject of any diathesis and enjoyed excellent health, the only illness she had had was smallpox at the age of four. It was as a result of this illness that the right cornea was affected following which the slight opacities remained. These opacities of the cornea amply explained the vision of ⅓, especially with a mixed astigmatism.

As to the trachomatous lesion, she had never suffered therefrom and could give no explanation of it, she was even surprised when we gave her hygienic advice regarding it. There was no history of intestinal worms.

Her hereditary antecedents showed nothing of interest, nor could anything bearing on her case be elicited.

The diagnosis of spontaneous serous cyst was made, for it was evident that we had not to deal with the sac of a cysticercus, or any solid tumour.

Energetic treatment for the granular conjunctivitis was proposed for the purpose of preparing her for a removal of the cyst. Not only did she refuse operation, but even medical treatment, and she returned to her home with an order for glasses. On her return some time later she reported that she was well and perfectly satisfied with her glasses.

We have thought this communication interesting because we have not found similar cases in medical literature. Unhappily, this observation is not as complete as we could have wished, since there was no microscopic examination of the cyst in view of the refusal of the patient to allow operation. In view of the history of the condition, the cyst having suddenly appeared in the anterior chamber, we may be allowed to put forward a hypothesis to explain its presence in that situation. It is not the intention to make a long dissertation to support or refute the different theories of the formation of cysts of the iris.

Schmidt-Rimpler believes that most frequently they are formed by a crypt whose opening is obliterated and whose cavity is filled by a liquid similar to the aqueous humor.

Mackenzie and Bowman think that it arises from the presence of a fluid secreted between the muscular coat of the iris and its posterior epithelium.

According to de Wecker, these tumours are the result of a simple infolding or saccular deformity of the iris.

In our case, it should not be forgotten that we have here a spontaneous cyst, for there is no history of traumatism. It has assuredly developed in the posterior chamber, either upon the ciliary body or on the posterior surface of the iris. Treacher Collins has published observations with microscopic examinations of spontaneous serous cysts, adherent, which have developed on that posterior surface underneath the normal pigmented layer of the iris.

It is to-day admitted that the lining membrane of these cysts is not always composed of epithelium. In fact, the researches of Ch. Robin upon the subject show that sometimes the wall of a cyst of the iris does not possess epithelium, but only a material composed of fine, fatty, granules with a small number of pigmented cells.

According to the same author, the wall is formed by the tissue of the iris which seems to be doubled upon itself to give origin to a cavity. This opinion is also shared by Bowman.

In our patient, if this cyst has developed as have those reported by our English colleagues, if it has formed itself at the expense of the ciliary body or even of the posterior part of the iris according to one theory, it is not the less true that it has

had at some time a pedicle. This must have been filiform; and eight years ago, under the influence of some cause which cannot be determined, it has broken away from its point of attachment. Once free, the cyst being squeezed in the posterior chamber has naturally passed into the anterior chamber by the pupil. Very careful examination shows its anterior wall to be a little less convex than its posterior, and leads us to suppose that the pedicle was upon the posterior surface. The cyst, during the eight years it has lain in the anterior chamber, preserves its consistence by the renewal of its liquid contents, at the expense of the internal granular layer. Its external wall, surrounded by the aqueous humor, furnishes it by endosmosis with the elements necessary for the maintenance of its vitality. Thus its appearance is always the same and this iris, being accustomed to its contact, is not irritated thereby. If it will always be so remains a question.

Such is the hypothesis we advance on the subject of this mobile cyst in the anterior chamber, a condition so interesting by reason of its extreme rarity. Once more we express our regret at not having been able to operate upon this case and our consequent inability to present a microscopical report of the tumour with the clinical details.

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TRANSMISSION OF DISEASE.

From the wide experience which Dr. Doty must have had as health officer of the Port of New York, one must conclude that his opinion upon the means by which infectious diseases are transmitted bears more than a little weight. He strongly combats what is known as the fomites theory which he defines as the belief that infectious diseases are constantly transmitted through cargoes of vessels, clothes, money, etc. While this theory is plausible and very popular there appears to be on investigation a constantly diminishing belief in it, since scientific bacteriological researches and the observations of practical sanitarians fail to support it. Dr. Doty points out that Yellow Fever is transmitted only by the mosquito, and that clothing, bedding and even the discharges of patients do not act as a medium of infection and are perfectly harmless. The mosquito, also, is the only medium of infection for malaria, while plague is communicated by the rats through the medium of fleas which infest them and fomites have but little, if anything, to do with the extension of the disease. He next discusses the transmission of Smallpox, Typhus Fever, Measles and Scarlet Fever, and points out in connection with Smallpox that the statements concerning the infection through the air being carried to a distance of half a mile or more, and that clothing which had been laid away for years may act as a medium of infection, and that persons have become infected in rooms which months previously had been disinfected,—these, says Doty, are statements accepted by practical sani-

tarians with a great deal of skepticism. Coincidences are chiefly responsible for the apparent proof of these statements.

In regard to Measles, Scarlet Fever and Diphtheria spreading to others from the clothing of well children, another explanation more plausible seems to be found in the fact now widely recognized that a child apparently well may communicate disease to others. Bacteriological examination alone demonstrates the fact that these children are carriers of infection.

In the case of Measles and Scarlet Fever, where the specific germ has not yet been discovered, a simple coryza or unnoticed desquamation may explain the infection. These results are constantly being presented where careful medical inspection is in operation.

Regarding rags used for commercial purposes and gathered from all parts of the world, frequently from where infectious diseases exist, the writer states that after giving this subject long and careful investigation, both in this country and in Egypt, he has yet to find conclusive or satisfactory evidence that such articles of commerce act as a medium of infection. There was no evidence found by English sanitary authorities working in Egypt to show that men, women and children constantly in contact with these rags in sorting rooms were more prone to infectious disease than those following other pursuits.

His investigations upon paper money as a medium of infection have a similar result. Those who handle such money, for instance in the Treasury Department of Washington, are not more prone to disease than others. The bacteriological investigation of paper money made in Yale University led to the conclusion that the bacteria present in paper money are nonvirulent, and that the forms most present are the air forms. From this it is concluded that money constitutes an unimportant factor in the transmission of disease.

The failure to arrive at uniform opinion regarding the transmission of infectious diseases is unquestionably due to the popularity of the fomites theory. No one doubts that in some unusual and rare instances, clothing, rags, and almost any article may transmit disease, but this is not the most important factor for practical sanitarians to consider. Indisputable evidence shows that infectious diseases are usually transmitted from the sick to the well, and another common means favoring such transmission, of which conclusive proof has been presented, is that well persons act as carriers of disease—insects carry disease.

This knowledge we now possess justifies a great diminution in disinfection hitherto performed, and Dr. Doty says that he has yet to meet with an instance where the delay and annoyance constituting an ex-

ceedingly expensive process in order to disinfect the cargo of a ship, or to attempt to do so, was justified. From the practical standpoint, referring to sick room disinfection, there is but one agent that can be depended upon to destroy the organism, that is heat, either by boiling or by incineration, and the practical abandonment of the fomites theory not only does not, as many believe, involve danger, but substitutes for it a scientific, practical and successful means of dealing with outbreaks of infectious disease.

THE LAKE EDWARD SANITARIUM.

The province of Quebec at last is in possession of a Sanitarium for the cure of tuberculosis, and about this time circulars are being sent out to the physicians of the province calling for the recommendation of incipient cases of tuberculosis to the Institution. The Sanitarium building is now completely equipped for the accommodation of thirty patients, and we are able to state from personal observation that it is thoroughly up to date, and is outfitted in a first-class manner. Dr. W. E. Ainley, late of Lachine, previously of the Montreal General Hospital staff, is in charge as Medical Superintendent, and Miss Dodds, formerly of the Vermont State Sanitarium, of Saranac Lake, and previously of the Montreal General Hospital, is in general superintendence of the service of the house.

The Sanitarium has been built at a cost of about $35,000, which, along with a considerable sum for its maintenance, has been subscribed by the citizens of the city of Quebec, with the exception of a single subscription of one or two hundred dollars from a Montreal citizen. It is well known how heavy are the claims made upon the English-speaking population of the city of Quebec, and it is greatly to their honour that they have so nobly supported the promoters of the Sanitarium scheme. A great debt of thanks is due from the province at large to the Hon. Richard Turner, the president of the board, whose work from the very inception of the idea until now has been unremitting.

It may be said of the building and furnishing, that every room in the Sanitarium connects with a balcony, and that in nearly every case the bed, if necessary, can be wheeled directly on to a balcony. The entire building is heated by steam, lighted by electricity, fitted with telephones, electric bells, and a complete system of fire protection and of fire escapes. In the engine-house near by are the pumps for the water supply and the dynamos for the supply of electricity. A large tract of land surrounding the building has been given by the province of Quebec, and it is hoped that the Sanitarium will become the centre of a system

of cottages, such as is in vogue at Saranac Lake. The hospital looks to the southward, over the beautiful expanse of Lake Edward, which, as is well known, is situated about one hundred miles north of Quebec on the Quebec and Lake St. John division of the Canadian Northern Railroad.

In the Sanitarium no free patients can be admitted, and this is not that the benevolence of the Founders is lacking, but that it simply cannot be done with the present resources. Every patient in the Sanitarium will receive the same food, attention and nursing, and all the rooms are counted as of the same value. No patient will be accepted who cannot pay seven dollars per week, which is about five or six dollars per week less than the actual cost of the patient. In consideration of this fact no patient will be admitted at the minimum rate of seven dollars, unless he carries a certificate from his clergyman and his physician that he is unable to pay a higher rate, but it is hoped that patients will be admitted who can pay the twelve or thirteen dollars a week necessary for their maintenance, or even more, as an offset to the expense incurred by their fellow inmates, who are less well able to pay.

We are perfectly prepared to hear some one criticize this Sanitarium, because it does not admit free patients, but if there are any such, we beg to remind them that it was not their money that built the Institution, and we think that it is a very generous thing that the citizens of Quebec should put at the disposal of the rest of the province room in this splendidly furnished institution. We trust that every medical man who has an opportunity, will recommend the right kind of case, because this Sanitarium is to cure incipient tuberculosis, and not in any sense to house dying consumptives. It is, therefore, necessary that great care be exercised, and that no patient shall be sent who has not a good chance of cure. And further, it is necessary that the physician exercise his judgment so that patients who will reap the benefit of this institution shall pay according to their ability. If these two points are carefully observed, we venture to think that the middle classes of the province of Quebec, and especially of Montreal, will have cause abundantly to thank the open handed citizens of Quebec for their liberality and generosity.

THE WINNIPEG MEETING.

The Winnipeg meeting of the Canadian Medical Association, under the Presidency of Dr. Blanchard, with Dr. Steney Smith as secretary and stage manager, will stand out in the memory of those who attended it as more perfect in its arrangements and more smooth in its running than any of its predecessors. Lovely weather and genial western—or central—hospitality afforded to visitors one and all made the meeting

additionally memorable. The attendance equalled, nay, we believe, surpassed that at any predecessor. The impression left upon us was that the level attained by the Association is steadily and surely rising: that the general average of the communications in the different sections was better, the discussions more able, the influence of the Association greater than in previous years, good as have been the recent meetings. So much material was provided that it was possible to divide the work into five sections:—Medicine, Surgery, Obstetrics and Gynæcology, Eye and Ear, and the Laboratory Workers. The combined discussion was upon Nephritis, and here a thoughtful series of papers, medical and surgical, was followed by an excellent discussion opened by Dr. William Mayo, of Rochester. Of the social engagements the conversazione (and dance) at the Royal Alexandra Hospital, the afternoon reception on the grounds of Government House, given by the Lieutenant-Governor and Lady Macmillan, and the "smoker" were beyond praise. So good, in fact, was the last that the annual dinner held at previous meetings would seem to be doomed, even if other cities cannot hope to present the same intramural and extramural talent possessed by the capital of Manitoba. The chime of the "Man, Man, Man from Manitoba" still haunts us.

Of work accomplished for the profession at large that most deserving of notice was the determination eventually reached to establish an official journal of the Association. We believe that herein the Association is taking a step of the utmost importance for our profession here in Canada. At the same time we who have for all these years been engaged in medical journalism recognize very fully the seriousness of the step. We need a journal which shall interest and worthily represent the profession from one end of the Dominion to the other. This journal, high as have been its ideals, has never attempted such a task. We have, however, time and again found it difficult enough to interest our more limited clientele. When, as has happened on more than one occasion, we have accepted and printed a series of articles representing the most advanced work performed in our Montreal laboratories, we have found that those articles, while quoted with appreciation by medical papers in the States, in England and on the continent at large, have been too strong meat for the ordinary reader: when, on the other hand, we have unbent and attempted to afford a lighter and more varied fare we have been assailed with fear lest the reputation of the journal were being lowered. It is in short extraordinarily difficult to keep a medical paper on the highest level and at the same time to interest the ordinary reader in general practice. It is between this Scylla and Charybdis that the ship of the Association must be steered. That it is possible to accomplish the passage, witness the

journal of the American Association; all must depend in the first place upon who is appointed helmsman, and, in the second, upon the way in which the crew behaves, or otherwise upon the loyalty of the support given to the new journal by the profession during its early and perilous years.

Yet another matter of good augury was commenced at this meeting and must influence the policy of the Association and of the profession at large. We refer to the announcement that the four western provinces, British Columbia, Alberta, Saskatchewan and Manitoba, have reached a practical understanding to establish a common examination board, the details of the scheme alone remaining to be settled. There could be no better news. We know and we appreciate the fears of the different provinces, the relatively crowded condition of the profession in Manitoba, the fear manifested in British Columbia more particularly, but also in the other two provinces, that the country may become swamped with Manitoba men, the general impression throughout the West that the course and training at Winnipeg are not all that could be desired: the fear that as this is the only medical school in the West the standard of examination may have to be kept low. Knowing all this we admire all the more the broad spirit which has prevailed, and the spirit which regards the artificial boundaries of the provinces as no adequate reason why the Canadian practitioner may not pursue his beneficent work throughout the West. Let us assure our Western confrères that they are achieving that which must inevitably influence the whole Dominion and bring about what through political influences the Roddick Bill was prevented from accomplishing. If the West takes the lead the East must follow suit, and within a very few years we must see professional free trade from the Atlantic to the Pacific. We cordially congratulate our Western brethren over this notable advance.

Reviews and Notices of Books.

Lectures on Hysteria and Allied Vaso-Motor Conditions. By Thomas Dixon Savill, M.D., Lond. New York: William Wood & Company; London: Henry J. Glaisher, 1909.

In the preface to this work on Hysteria the author informs us that his wife has materially helped him in many valuable criticisms and suggestions. This practice of authors of medical works of obtruding their wives upon the notice of readers is a growing one, and is a stigma of hysteria in husband, or in wife, or in both. There might be some excuse for it in a work upon Hysteria did we not remember that from a woman you can learn nothing of women: they do not betray their secret. The most succinct statement upon the ætiology of hysteria is that with which lecture VII opens: "The essential and omnipresent cause of hysteria is an inborn and inherited predisposition to develop hysterical manifestations,"—which is much like saying that an archdeacon is one who exercises archidiaconal functions. And yet the author arrives at the conclusion that a majority of hysterical phenomena are dependent upon a lesion of some kind, that this lesion consists of a vascular change in the part, and that this change is affected through the sympathetic system. We venture to think that the cause of hysteria lies much deeper than the vascular system; that, in short, it is an affair of morality. Up to a certain point the woman accepts her femininity and all that is implied thereby with unquestioning obedience. In time there comes a discontent with that negative condition of existence, and she becomes imbued with ideas which are foreign to her normal mind and opposed to her real nature. She puts on a superficial, sham self, which is but an imitation of the masculine morality. This new personality shows itself in self-confidence, independence, and assertiveness; but at the touch of some rough reality this artificial imitation flies in pieces, and the conflict between her real nature and this unnatural self produces those phenomena which are known as hysteria. It is a contest between what she knows to be true and what she suspects is false. Nor does the presence of hysteria in the male contradict this theory, since there are men with the nature of women as well as persons who are anatomically female and yet psychically male. Dr. Savill quotes Sydenham with apparent approval: "As to females, if we except those who lead a hard and hardy life, there is rarely one who is wholly free from them; and females, be it remembered, form one half the adults of the world." For so wide-spread a disorder there must surely be a more deeply grounded cause than a vascular lesion. This book contains everything

which has already been said upon hysteria; but it by no means plucks out the heart of the mystery.

SEMMELWEIS: HIS LIFE AND HIS DOCTRINE. A chapter in the History of Medicine by SIR WILLIAM J. SINCLAIR, M.A., M.D., Professor of Obstetrics and Gynæcology in the University of Manchester. Manchester, at the University Press, 1909.

We imagine that it will be a surprise to most readers that, until the publication of this handsome volume of near 400 pages by Sir William Sinclair, there has been no adequate biography of Semmelweis in the English language, with the exception of a short monograph published by Dr. Duka in 1888. Even in Germany his "Aetiologie" was inaccessible until 1905, when Dr. Tiberius von Gyory of Buda Pesth under the auspices of the Hungarian Academy of Sciences published his collected works under the title "Semmelweis' Gesammelte Werke."

One turns at once to the book for an expression of opinion upon the fiction which has grown up chiefly in the United States that Dr. Oliver Wendell Holmes was the discoverer of the ætiology and treatment of puerperal fever. The author leaves one in no doubt. He pronounces these claims "mistaken and altogether groundless. Only misapprehension could have made such pretensions possible." At page 354 the author discusses the matter very fully and records the following opinion: "Holmes passed in review the work of others; he did not contribute a fact of his own personal experience or an original idea towards solving the problem of causation." However, he admits that Holmes' essay published in an evanescent Medical Journal in 1843 contained "rhetoric but very telling and useful rhetoric" in making known the discoveries of others.

The history of medicine in Vienna before the time of Semmelweis was one of detestable intrigue: "the methods of controversy were hateful and contemptible." Boer, the greatest obstetrician of his time, who had reduced the mortality from puerperal fever in the lying-in division of the hospital to .84 per cent, was removed on the pretext of insubordination; and in the first year of his successor, Klein, it rose to 7.8 per cent. His assistant was Semmelweis, who was described as "a young vigorous man of eight and twenty, somewhat florid, stout, and prematurely bald; he was frank and smiling with something almost puerile in his address." In this hospital there were two divisions. The medical students were restricted to one and the midwives to the other. The mortality in the one which the medical students attended was nearly ten per cent., and in the division which the midwives attended it was scarcely over three per cent. The accounts of the condition in the first

division are horrible. Women in their last agony declared they were perfectly well because they believed that the interference of a student or physician was a sure precursor of death. By a rigid process of reasoning Semmelweis arrived at the conclusion that the frightful devastation of puerperal fever was due to the cadaveric material adhering to the examining hands which had just been employed in the dissecting room and the dead-house. In May 1847 the practice was introduced of washing the hands in a solution of chlorinated lime and immediately the mortality dropped from eleven to three per cent.

It was ten years before Semmelweis finally resolved to publish a book upon the subject which occupied his whole life. He had "a congenital aversion from writing," an "inborn dislike for everything which can be called writing."

The life of Semmelweis was a long tragedy. He had a burning enthusiasm to lessen the woes of humanity. Opposition, contradiction, and neglect were his portion. Possibly there was something in his own character and conduct which incited strife and bitterness, though that makes the tragedy greater rather than less. Indeed there was evidence of eccentricity long before the mental derangement which clouded his last days. He died at the early age of 47 years.

In England alone did this discovery meet with respectful consideration, and it is fitting that this fine biography, the best in any language, should be written in English. The book is a valuable addition to the literature of medicine and Sir William Sinclair deserves the thanks of the whole profession for his labour in making it.

EXERCISE IN EDUCATION AND MEDICINE. By R. TAIT MCKENZIE, A.B., M.D., Professor of Physical Education, and Director of the Department, University of Pennsylvania. Octavo of 406 pages, with 346 illustrations. Philadelphia and London: W. B. Saunders Company, 1909. Cloth, $3.50 net; Half Morocco, $5.00 net. Canadian agents, J. F. Hartz Co., Ltd., Toronto; W. B. Saunders Company, Philadelphia and London.

No person could be better equipped for writing a book upon exercise in education and medicine than Dr. McKenzie. To begin with, he knows how to write, and in the second place, he knows what he is writing about, two qualifications which cannot be over estimated. Dr. McKenzie is himself educated physically and mentally and he has educated students physically and mentally these fifteen years past. Also, he practised medicine in the hospital in the world at large, in the consulting room, and in the gymnasium. As if this were not enough—athlete, physician, writer, teacher, anatomist—he is an artist besides.

Dr. McKenzie followed the Arts course in McGill University to a conclusion. He graduated in medicine in the medical faculty of the same University. He served the usual term in the Montreal General Hospital. He was director of physical education, and practised, at first general and then special, medicine. For years he taught anatomy in the dissecting room. He faithfully recorded his observations in these various fields and reflected upon them. All these years he was pursuing an independent career in Art, until at length his sculpture was regularly exhibited at the Salon of Paris and the Royal Academy of London. In addition, he is a man of common-sense, scientific honesty, and good judgment, not drawn aside by the allurements of this system or of that, but willing and able to find in each the exact line between fact and pretence.

The book in question is precisely such a book as such a man would write. Dr. McKenzie set out to do a thing which was worth doing, which he knew perfectly how to do. He did it slowly and perfectly. In short the book is the man, a classic in the same way that Gray's Anatomy is a classic.

The illustrations are 346 in number and are for the most part from the author's own drawings, models, or sculpture. The masks which illustrate fatigue are modelled from life and are especially striking. Artistic care is evident even in the photographs of the most commonplace subjects, which makes the book as much a product of the studio as of the laboratory or gymnasium.

The literary presentation of the subject is worthy of like praise. It is clear, fresh, full, and pleasing, enriched with learning and illumined with flashes of wit. The book contains 24 chapters and deals with exercise in every aspect which it is likely to present to the physician or teacher, to the sick, the weak, or the healthy.

PROGRESSIVE MEDICINE. Edited by HOBART AMORY HARE, M.D., assisted by H. R. M. LANDIS, M.D. Volume III, September, 1909. Lea & Febiger, Philadelphia and New York, 1909.

The contents of this volume are: "Disease of the Thorax and its Viscera, including the Heart, Lungs, and Blood Vessels," by William Ewart, M.D., F.R.C.P. "Dermatology and Syphilis," by William S. Gottheil, M.D. "Obstetrics," by Edward P. Davis, M.D. "Diseases of the Nervous System," by William G. Spiller, M.D.

The September number of "Progressive Medicine" contains 329 pages and deals with four subjects: Diseases of Thorax, Dermatology and Syphilis, Obstetrics, and Diseases of the Nervous System. The contributors are: Dr. William Ewart, Dr. W. S. Gottheil, Dr. Ed-

ward P. Davis, and Dr. William G. Spiller. Tuberculosis, quite properly, receives a full consideration. Of Rosenberg's discovery of tubercle bacilli in the blood in tuberculosis the author says: "If it be confirmed that living bacilli occur in the blood of practically every tuberculous patient, then all other methods of diagnosis will sink into insignificance as relatively uncertain and late." Much stress is laid upon the observations of Miller and Woodruff recorded before the International Congress at Washington in 1908, with them 51 per cent. became infected. This suggests that the air and not milk is the vehicle in which the infection is conveyed. The review of tuberculosis of the lungs is a masterly one. The subjects of Dermatology and Syphilis occupy fifty pages and their treatment must be of great value to specialists, as it certainly is even to a general practitioner. In the review of "Obstetrics" there is an interesting statement, that podalic version was a common operation amongst the ancients and that all knowledge of it was lost for a thousand years until it was re-discovered by Paré. We imagine that all physicians who are alert for new methods and anxious for a judgment upon them will find "Progressive Medicine" a necessity. Its interest, however, for Canadian readers would possibly be increased if some mention were made of the work which is being done in this country.

Obstetrics. A Manual for Students and Practitioners. By David J. Evans, M.D., Lecturer on Obstetrics in McGill University, Montreal; Fellow of the Obstetrical Society of London. New (2nd) edition, enlarged and thoroughly revised. 12mo, 440 pages, with 169 illustrations. Cloth, $2.25 *net*. Lea & Febiger, Philadelphia and New York, 1909.

It is now some ten years since we had the privilege of calling this book to the attention of the profession; it is only a few months ago that we had occasion to mention that a translation had appeared in the Chinese language. A work which survives so long in the choked field of obstetrics has by that very fact proved its worth. The main changes we note are that the sections dealing with implantation of the ovum, development of the placenta, and toxæmia have been re-written in accordance with the more modern knowledge of these subjects. There are many minor changes and revisions; the operation of symphysiotomy, we are glad to learn, has fallen into disuse. As a writer, teacher, and practitioner Dr. Evans has won an honourable place in his department of medicine.

THE PRINCIPLES OF BACTERIOLOGY. A Practical Manual for Students and Physicians. By A. C. ABBOTT, M.D., Professor of Hygiene, University of Pennsylvania. New (8th) edition, thoroughly revised. 12mo, 631 pages, with 100 illustrations, 26 in colors. Cloth, $2.75, *net*. Lea & Febiger, Philadelphia and New York, 1909.

It seems a great many years since the present writer reviewed the first edition of Abbott's "Bacteriology," probably twenty, and this is the eighth time one has mentioned the appearance of a fresh edition. As one examines this, the latest, it is remarkable how little change there has been in the principles of the subject in all these years. With the exception of the articles on infection, immunity, phagocytosis, and vaccination the first edition would yet do very well as a safe guide,—and not for the beginner alone as the author so modestly suggests. It would seem certain that Abbott's "Bacteriology" has won a permanent place in the minds of students.

MEDICAL JURISPRUDENCE. Forensic Medicine and Toxicology. By R. A. WITTHAUS, A.M., M.D., and TRACY C. BECKER, A.B., LL.B. Second edition, Volume III. New York: William Wood and Company, 1909.

This volume, containing near 1,000 pages, completes the issue of this extensive publication. The subjects with which the volume deals are: Medico-legal Relations of Vision and Audition, and of Injuries to the Eye and Ear, by J. H. Woodward; Medico-Legal Relations of Insurance, by A. L. Becker; Medical Aspects of Insanity in its Relations to Medical Jurisprudence, by Edward D. Fisher; Mental Unsoundness in its Legal Relations, by Tracy C. Becker and Charles A. Boston; Care and Custody of Incompetent Persons and their Estates, by Goodwin Brown, revised by A. L. Becker; Medico-Legal Aspect of Marriages and Divorce, by A. L. Becker; Medico-Legal Relations of X-rays and Skiagraphs, by Albert G. Geyser; Medico-Legal Examination of Blood and other Stains and of the Hair, by James Ewing. An index of 70 pages completes the volume.

The volume opens with a list of cases which are cited. The list occupies fifty pages of double columns and must include 2,500 cases. It is proper to remark that the value of a decision depends somewhat upon the court in which it is given and somewhat upon the judge who delivers judgment. A jurist who relies absolutely upon the authority of a decision irrespective of its origin occupies a position which differs little from that of a Maccabean rabbi or a Chinese mandarin, by which is only meant that this book will have less authority outside of the United States than within. It will probably be of greater value to the lawyer

than to the physician, especially that part which gives a digest of the statutes of all the states upon the care and custody of incompetent persons. The respect accorded to expert medical evidence in the courts has not been increased by recent events in New York, an expert giving "evidence" on different sides according as he was paid for it. We trust that this important work will assist in restoring medical jurisprudence to its high place.

PHILADELPHIA GENERAL HOSPITAL REPORTS, edited by HERMAN B. ALLYN, M.D. Philadelphia: Printed by Dunlap Printing Company, 1909.

This is a publication entirely creditable to the Hospital from which it emanates in respect of quality of material and the arrangement of it.

NAVAL HYGIENE. By JAMES DUNCAN GATEWOOD, M.D. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street, 1909. $6.00, net.

This is the first book which we remember to have seen which deals with the hygiene of the naval force as apart from those measures which are employed in the army and in civil life. And yet the subject must be capable of separate treatment since this book upon it contains nearly 800 pages and weighs only a few ounces under five pounds. It contains eight coloured plates and 105 other illustrations. The author, Dr. Gatewood, is instructor in naval hygiene in the United States Naval School in Washington and medical inspector in the United States Navy. The very magnitude of the work is also a testimony to the growing magnitude of the navy with which it deals. There is a vast deal of information in the book upon every possible subject from ship-building to the proper method of cutting meat, cleaning fish and making bread. The author knows well how to interest his reader, even one who has no special knowledge of the subject. He writes clearly and agreeably and understands the handling of the long sentence, which is ever the mark of the experienced writer. On page 318 there is one sentence which occupies 21 lines of an average length of 12 words each. It would be hard to imagine a more complete book upon the subject or one which so evidently bears its authority with it.

THE BODY AT WORK, a treatise on the principles of physiology, 460 pages, with illustrations and index. Demy 8-vo. Price, 16s. net. By ALEX HILL, M.A., M.D., F.I.C.S.

In this book the author describes the phenomena of physiology in the light of the conclusions which modern science has drawn as to their interdependence and as to their causes. Its aim is to present a definite picture in which the broad outlines of scientific physiology, especially as

modified by recent research, are set forth in vivid language and maintained clearly in view without being obscured by a mass of detailed evidence.

Thus, while not professing to be a systematic text-book for the use of the medical student, the book appeals not only to the scientifically minded who wish to become acquainted with the developments of recent physiology, but also to a wide circle of both teachers and learners who are more especially interested in its medical applications.

THE OPHTHALMIC YEAR BOOK, Vol. VI. By EDWARD JACKSON, M.D., G. E. DESCHWEINITZ, M.D., and THEODORE B. SCHNEIDEMAN, M.D. Published by the Herrick Book and Stationery Company, Denver, Colo., 1909.

This valuable synopsis of the literature of Ophthalmology published during the year 1908 is a very useful work for the specialist. Every succeeding year the work is assuming larger proportions, and although much of the matter written during the year borders upon twaddle, yet one has to take the chaff with the wheat, if one wishes to secure the more valuable material. The book represents a vast amount of work in the digesting of the material at the command of the editors; this is thoroughly done, and a useful catalogue of the books and original articles published during the year is appended. J. W. S.

SEVEREST ANÆMIAS, THEIR INFECTIVE NATURE, DIAGNOSIS AND TREATMENT. By WILLIAM HUNTER, M.D., Edin., F.R.C.P., Physician and Lecturer on General Pathology and Morbid Anatomy, Charing Cross Hospital; Physician to the London Fever Hospital. Volume I, with historical schemes, charts and plates. Macmillan and Co., Limited, St. Martin's Street, London, 1909. The Macmillan Company of Canada, Ltd., Toronto. Price, $3 net.

Dr. William Hunter has devoted many years to the study of the severe anæmias, and is inclined to be dogmatic upon certain points; many of these are elucidated in the present volume. The subject of this volume, Addisonian Anæmia, is better known to many under the name Pernicious Anæmia, which term, however, Dr. Hunter wishes to render obsolete. Perhaps he is right, but whether he will succeed is doubtful: he points out that many kinds of pernicious anæmia are not Addisonian anæmia, but it seems to the reviewer that on this continent the terms are synonymous, and to those who have learned their medicine in the last decade we doubt if there is any distinction between the terms. Dr. Hunter thinks, perhaps reasonably, that there is a cruelty to the patient

in using a term of such evil omen, and for this reason would drop it. Whether this will succeed remains to be seen.

Throughout parts II, III and IV, the author stands firmly for the name Addisonian Anæmia, and here he is undoubtedly right. Addison described the disease in 1822 fully, correctly and lucidly. In 1871 Biermer confounded it with many other anæmias and made a mess of the whole affair. The world with its usual lack of wisdom began to talk about Biermer's anæmia, when they meant Addison's anæmia, and Biermer himself has since more than once shown that he had no definite conception of the Addisonian, apart from other severe anæmias. As often happens, his compatriots at once dubbed the disease Biermer's anæmia, quite ignoring the fact that is beyond cavil, namely, that Addison had done all that Biermer did, better and fifty years earlier. Dr. Hunter fights a good fight for his British predecessor, and must be admitted to have all the right of the argument.

With the controversial ground cleared, part B deals with the pathology of the disease, especially with hæmolysis. Much of this work is from the author's own hand. The iron pigment deposited is a definite part of the process, and its distribution largely in the liver as compared with the spleen (a reversal of the usual state of affairs) is distinctive. This is an initial not a terminal symptom, and persists.

In etiology, the author points out the frequency of glossitis, and other infective lesions of the alimentary tract. This is undoubtedly a point of prime importance. Finally, the bone-marrow changes are dealt with, and the hæmatological characters of the disease. An excellent bibliography and index complete the volume.

The book has a great deal, perhaps too much, of historical reference, for less would have proved the writer's contentions; but the historical, as well as the purely technical parts, come from the pen of one who has more knowledge of the disease at his command than has any other man, and it is always a pleasure to read the work of a man who knows to the most precise degree about what he is writing. J. McC.

The Rectum. Its Diseases and Developmental Defects. By Sir Charles Ball. Oxford Medical Publications, D. T. McAinsh & Co., Toronto.

This work, published in 1908, is undoubtedly the best, at present, in the English language on the subjects covered by its title. The suitability of its form, binding and printing makes of the reading a pleasure and the illustrations are accurate and clear. The anatomy and development of the rectum are fully and clearly given and yet in so few words as to suit the needs of even a junior student. Throughout the work the

author exhibits a wise conservatism, as shown well in this distrust of the complicated specula that have been often highly recommended for the diagnosis of high rectal diseases. The statement of his results after excision of the rectum for cancer, while not encouraging, point to the necessity of an earlier diagnosis. His chapters on the treatment of pruritus ani and on rectal prolapse are worthy of careful attention.

This work cannot be too highly recommended not only to surgeons but also to general practitioners and student. C. P. K.

HANDBOOK OF DISEASES OF THE RECTUM. By HERSCHMAN, 1909. C. V. Mosby Co., St. Louis, Mo.

The author commences his work with a chapter on the anatomy of the rectum, and this, as it is practically a reprint of Ball's work on "diseases of the rectum," is good. He omits any reference to the development of the rectum and nowhere mentions any of the congenital defects of the rectum or anus. The work is characterized throughout by a want of completeness in every subject mentioned and by the insertion of a large number of useless plates. The text drops into italics on the slightest, and one might say on no, provocation. The author shows a marked desire to coin new and useless words. When one finds that a chapter is devoted to the examination of fæces with a view to determining such conditions as "alcoholic stools," one feels that the author has wandered far afield. This work is without the slightest reason for being in existence. C. P. K.

OSLER'S MODERN MEDICINE. Volume VI. Lea & Febiger, Philadelphia and New York, 1909.

Almost half of the sixth volume of this now well known system is devoted to the urinary system. Dr. J. McCrae in his introductory article deals with the physiology and pathological physiology of the kidney. He succeeds, in a somewhat difficult subject, in placing before the reader an excellent synopsis of existing views, and what is of no less importance in indicating many features in which current knowledge is defective or uncertain. Anomalies of the urinary secretion is dealt with by Dr. Garrod, but in less detail than is often found in the larger textbooks on diagnosis. A chapter on uræmia by the same author is more interesting and gives a clear account of the theories, symptoms and treatments of this protean disorder.

The section on nephritis by Dr. J. B. Herrick is in every way an excellent one, being thoroughly practical as well as giving prominence to theoretical considerations and experimental results. The usual classification into acute, acute parenchymatous and chronic interstitial ne-

phritis is retained, whilst the last named is subdivided into primary interstitial nephritis, secondary contracted kidney and the arterio-sclerotic kidney. The writer insists, however, on the impossibility of sharply defining these classes either pathologically or clinically. The clinical manifestations of nephritis are described in detail and there is little left unsaid in these paragraphs. A somewhat fuller discussion of the relationship of the kidneys to the changes in the heart and vessels would have proved acceptable, but the author has evidently preferred to devote his space to the more practical aspects of his subject.

The bacteriology of the Infections of the Urinary Tract and Pyogenic Infections of the Kidney are discussed in a well written article by Dr. F. R. Brown, whilst Dr. H. H. Young writes on Tumors of the Kidney, Urinary Lithiasis and Calculi and on Genito-Urinary Disease with Disease of the Prostate. The frequency of carcinoma of the prostate, to the recognition of which the profession owe so much to Dr. Young, is duly emphasized.

Dr. Dock's article on the ductless glands is very complete and is particularly valuable in introducing the numerous recent advances in our knowledge of this subject.

Under the heading of Diseases of Obscure Causation are included Hodgkin's disease, Arthritis Deformans, Osteomalacia, and Adiposa Dolorosa.

The chapter on Arthritis Deformans, by Dr. Thos. Macrae, is an excellent account of the pathology and clinical features of the disease. The joint changes are regarded as probably due to bacterial toxins, and the deleterious influence of infections of distant parts is quoted in favor of this view. The skiagraphs and plates illustrating the text are well chosen and helpful.

Vaso-motor and trophic disorders are treated by Doctors Osler and Emerson. Raynaud's disease, by the former writer, is written in a graphic and simple style, and the main features of the disease are presented in such a way as to prove of much value to the teacher and student. The usual gloomy prognosis in this malady is brightened by a description of milder types of the disease ending in recovery. The chapter on Angio-neurotic œdema is a valuable contribution to a subject to which the author has devoted several important papers.

A short chapter on the Medical Aspects of Life Insurance, by Dr. Greene, concludes the volume. It is regrettable that no statistics bearing on the insurance of impaired lives are introduced. Carefully compiled results from the archives of the large companies would do much to place the selection of risks on a more scientific basis.

The volume, as a whole, is a credit to the editors and contributors, and is well up to the high standard already set in the earlier volumes of the system.

A Treatise on the Principles and Practice of Medicine. By Arthur R. Edwards, A.M., M.D., Professor of the Principles and Practice of Medicine and Clinical Medicine, Dean of the Faculty in the Northwestern University Medical School, Attending Physician to Mercy, Wesley Hospital, etc. Second and thoroughly revised edition, illustrated with 100 engravings and 21 plates and containing 1,257 pages. Lea & Febiger, Philadelphia and New York.

The first edition of this book appeared in 1907 and was given a brief and favorable review in this Journal in August of that year. In closing the notice written at that time we remarked that the work should pass through many editions. The early appearance of the second was at once a commendation of the book and of the author's activity and desire to keep abreast of the times. With his characteristic directness of style, Dr. Edwards succeeds in giving a "vastly greater amount of information in a space decreased by 70 pages." This information comprises new chapters on cardiac arrhythmias, cardiac neuroses, tropical splenomegaly; references to the use of anti-meningitis serum of Flexner and Jobling, recent epidemics of meningitis and poliomyelitis, the spirochæte of syphilis, the status of tuberculin therapeutically and diagnostically.

The contents are comprised under eleven sections, the arrangement of which differs but slightly from that in the former edition,—the section on Intoxications and Sun-stroke terminating the book where that on Diseases due to Animal Parasites was found in the first edition. We have much pleasure in commending the book as one helpful to students and practitioners alike. W. F. H.

Common Disorders and Diseases of Childhood. By George Frederic Still, M.A., M.D., F.R.C.P., Professor of Diseases of Children, King's College, London. Cloth, 731 pages, with illustrations. Price, $5.50. Oxford University Press, London, 1909.

This rather modest little book is of interest as giving us the mature ideas and views of one of the leading English pædiatricians. Dr. Still declares in his preface that this is no systematic treatise or textbook, but that he has chosen to be selective and discursive as it suited his bent, and he has carried out this idea in a very fascinating manner. Perhaps the most interesting chapters are those written not about definite diseases but about commonplace conditions and symptoms in children, such as

are seldom considered in ordinary text-books. Sections on "dental caries," "teeth-grinding," "bilious attacks so-called," "fever of obscure causation," "nervous children," "disorders of speech," and "morbid habits in children" will be found of great value to any ordinary practitioner.

The illustrations and charts are unfortunately very few in number; those that are present are well chosen and illustrative. The sections on infant-feeding and disorders connected therewith are very short and concise, but clearly written, the writer naturally following the teaching of the English school. It is chiefly in connection with the nervous diseases that Dr. Still exercises his claim of being discursive. Chapters on "Mongolian Idiocy," "spasms nutaus," "habit spasm," "the cerebral palsies," etc., are especially complete and illustrated with a great wealth of statistics and clinical observations.

Altogether the book is one of the most interesting of those recently published on the subject of children's diseases from a clinical standpoint, and will be found to furnish many valuable hints to anyone specially interested in the study of children.

MANUAL OF DISEASES OF THE EYE. By CHAS. H. MAY, M.D. Wm. Wood & Co., New York, 1909. Price, $2.00 net.

The appearance, after so short an interval, of another edition of this text-book is evidence of its deserved popularity. The present writer, in reviewing the last edition of the work, stated that he considered the success of the book was in an appreciable measure due to its convenient size; and he again notices with satisfaction that, while the recent advances in ophthalmology have been carefully incorporated in the volume, this has not been done at the expense of one of its best features.

W. G. M. B.

POLITZER ON THE EAR. New (5th) edition. A text-book of the Diseases of the Ear, for students and practitioners. By PROFESSOR DR. ADAM POLITZER, Imperial-Royal Professor of Aural Therapeutics in the University of Vienna; chief of the Imperial-Royal University Clinic for Diseases of the Ear in the General Hospital, Vienna, etc. Translated and edited by Milton J. Ballin, Ph.B., M.D., Assistant Surgeon, New York Ophthalmic and Aural Institute, and Clarence L. Heller, M.D. Fifth edition, enlarged and thoroughly revised. Octavo, 892 pages, with 337 original illustrations. Cloth, $8.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1909.

It is with great pleasure that we take the opportunity of review to bestow unqualified praise upon this work. The present edition was made

necessary by the rapid advances made in recent years especially in our knowledge of the pathology and operative treatment of suppurations in the internal ear and knowledge of the functions of the labyrinth. The functional tests for the condition of the labyrinth have been very carefully worked out and studied in the author's clinic, and so his reports of these results will be welcomed by all. The discussion of the various diseases is most thorough and unbiased. All sides of the questions are dealt with impartially, and where the author gives his own judgment on some obscure point it is done with a modesty that is doubly admirable in so great an authority. The book is a veritable mine of literary reference, invaluable to the specialist. The sections of the suppurative conditions of the middle ear spaces and their complications, which will perhaps be of most interest to the general practitioner and surgeon, are dealt with in a clear and comprehensive manner which leaves nothing to be desired. The translators, Drs. Ballin and Heller, deserve due share of praise for their most excellent work of translation. It only remains to offer our word of congratulation to Prof. Politzer on the appearance of this new edition of his great work and to wish it a full measure of well-merited success. E. H. W.

A Treatise upon Operative Technique (in French). By Chas. Monod, Professor of Surgery in the University of Paris, and J. Vauverts, Surgeon to the State Hospitals of Lille, France. Second edition of second volume.

The second edition of the second volume of this now well-known work upon operative technique has just appeared. The second edition of the first volume appeared about 9 months ago. The whole work has been completely remodelled and has been brought right up to date in all matters surgical.

This volume deals with the surgery of the mouth, œsophagus, intestines, liver, pancreas, prostate, testicle and lastly with the female generative organs. The authors have not attempted to give a complete enumeration of all the surgical methods that are in or out of vogue, but have exercised a wise choice based upon a wide experience, of the best surgical procedures, which they outline in detail, and then later describe in what particulars other methods differ from these and what are their chief indications. Perhaps it is to be regretted that the reasons which governed them in their choice have not been discussed, but one must admit that to have discussed a plan of attack in given cases would have drawn the authors into the domain of surgical therapeutics; again to have treated of the merits of operations would have been to enter upon the subject of surgical results, and the work could no longer have been pub-

lished under its proper title of "A Treatise upon Surgical Technique."

Monod and Vauvert's work is a reliable outline of all the surgical procedures now acknowledged by surgeons in general to be worthy of a place in a volume of this kind. There is a strong tendency for certain operations (and this applies to all the branches of the less exact sciences) to live in text-books, from decade to decade, long after they have ceased to be applied by surgeons of repute. Fortunately the authors have had the requisite courage to strike through many of these and to consign them to well-deserved oblivion. Monod, with his wide experience in surgical matters, was perhaps best fitted at the present day to carry out this policy of retrenchment.

Every new procedure is, on the other hand, outlined with a clearness that leaves nothing to be desired. To those who have studied anatomy in the English schools a difficulty will present itself in the differences of anatomical nomenclature, but these after all are few in number and are readily overcome.

The bibliography at the end of each chapter is one of the most valuable assets of the work, for it is complete and covers the whole of the literature of surgery.

The work is a remarkably complete and valuable one in which those interested in surgery will find a detailed and most accurate description of all present day surgical procedures, and the 2,337 plates (mostly black and white) add much to the value of the volume as a reference book of surgery.

Retrospect of Current Literature.

OTO-LARYNGOLOGY.

UNDER THE CHARGE OF DRS. BIRKETT AND JAMIESON.

SIR FELIX SEMON. "Remarks on a Case of Pneumococcus Invasion of the Throat, upon which Laryngeal and Pulmonary Tuberculosis Supervened." *British Medical Journal*, June 26, 1909.

In this article Sir Felix Semon presents in detail an account of the course of a grave case of pharyngo-laryngeal ulceration, the infecting agents being the pneumococcus and the bacillus of tuberculosis.

The writer had previously in the *Medical Magazine* (December, 1908) described two cases of pneumococcus invasion of the throat, their chief characteristics being profound asthma, ulceration of the affected parts, an almost entirely afebrile course, and complete absence of swelling of the cervical lymphatic glands.

The two earlier cases had run protracted courses, but in the end recovered completely except that some scarring remained at the sites of the ulcers. Accordingly, to the third patient a favorable prognosis was given, but unfortunately in this case, himself a physician, a secondary infection by tuberculosis took place, and death resulted.

This patient was under observation from October, 1908, till April, 1909.

At the onset there was found only swelling of the lingual tonsil; but in the second month a tiny ulcer appeared on the left wall of the throat, cultures from which yielded an almost pure growth of the pneumococcus.

In December there developed an acute œdema of the mucosa covering the arytenoids and the epiglottis. The condition varied from day to day, and once there was slight dyspnœa.

The patient was inoculated in January with a pneumococcus vaccine prepared from his own cultures, but he received no benefit from this.

Soon afterwards his condition became much aggravated. Fresh ulceration occurred in the pharynx and over the arytenoids, and the ventricular bands "were either covered with some ashy-grey deposit or were infiltrated." Examination of the lungs revealed slight dullness and harsh expiration "on the right side, corresponding to the spine of the scapula."

Now, and apparently for the first time, tubercle bacilli were found in small numbers in the sputum.

From this time on the patient went downhill rapidly, and died in the end of April, whether of pulmonary tuberculosis or of pneumococcus infection or of both combined being undecided.

Scrapings of the ulcerated surfaces were examined at different times, and the reports of the findings were of no slight interest.

Thus on the 9th of February "Dr. Bulloch reported the extremely remarkable result he had obtained from the scrapings of the patient's pharyngeal and laryngeal ulcers which I had effected two days previously. Whilst the *pharyngeal* specimens were simply teeming with *pneumococci* without any evidence of tuberculosis, the scrapings taken from the ulcerated spots on the *arytenoid* cartilage contained large clumps of *tubercle* bacilli..... together with very numerous pneumococci."

A subsequent report from Dr. Collins, dated March 24th, runs as follows:

"*Posterior Part of Tongue.* — Scattered single and one large clump of tubercle bacilli, some pneumococci, and a few staphylococci and streptococci.

"*Pharynx.*—A few tubercle bacilli and a few pneumococci.

"*Epiglottis.*—Numerous tubercle bacilli, singly and in small clumps, numerous pneumococci, some staphylococci.

"*Sputum.*—Numerous tubercle bacilli, a few cocci, and short bacilli."

Sir Felix Semon traces the case from a primary pneumococcus stage, through the period where a secondary tubercular infection gained a foothold in the larynx, to the terminal condition where the pharynx showed "enormous improvement," but a terminal pulmonary affection marched steadily forwards.

He feels justified in presenting the fullest details "to assist further observers, and to enable them to build up a clinical picture of the disease." H. S. M.

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THE DIAGNOSIS OF SURGICAL DISEASES OF THE KIDNEYS.

BY

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Ever since it has been possible to diagnose renal diseases the physician and surgeon have, in the main, confined their attention to two chief methods of examination, abdominal palpation on the one hand and chemical and physical analysis of the urine on the other. No one can call in question the service which each method has rendered and continues to render us in the diagnosis of kidney disease, but at the risk of repeating what of late years has begun to figure very largely in works and papers dealing with this question it is perhaps not out of place to emphasize the shortcomings and limitations of such methods. Depending upon these, there are few surgeons who, directly or indirectly, have not come in contact with cases dying subsequent to operation from renal insufficiency, i.e. uræmia, cases which perhaps possessed but a single kidney, or at all events but a single healthy organ or even less than this, but where an operation in the dark had removed what little healthy tissue remained. Again, by such methods it has been impossible to differentiate bladder and renal disease, but it is unnecessary to enlarge further: the bare fact that so many ingenious instruments have been invented to enable us to separate the urines and examine these separately, that so many preliminary operations have been devised in order to enable us to estimate the working power of the kidneys before removing or incising one, even the reluctance to remove a diseased kidney which the surgical world has shown to within recent years, indicate the inadequacy of the older methods.

It is therefore the more elaborate and exact methods of which we would speak here. These consist of (1) the use of the simple examining cystoscope, (2) the use of instruments by means of the cystoscope, e.g. the ureteral catheter, wax tipped catheters, etc., or the use of instruments of inferior precision, such as the various segregators, (3) the estimation

Read before Canadian Medical Association, Winnipeg, August 24, 1909.

of the so-called functional efficiency of the kidneys by means of examination of the blood and of the urines collected from each kidney separately and simultaneously, (4) the use of the X-rays, (5) the use of the X-rays in combination with ureteral catheterization, X-ray bougies, pyelography, etc.

Perhaps Henry Fenwick is the greatest advocate of cystoscopy pure and simple, as a means of diagnosing renal disease. Through observation of the ureteral meatus we are frequently enabled to detect œdema, dilatation, congestion, ulceration and scarring and retraction, which with alterations in the urinary stream discharging from the meatus may suffice to lead to a correct diagnosis. Thus, in tuberculosis of the kidney, as Casper has pointed out, a marked bullous œdema may completely conceal the ureteral mouth, later this may give place to ulceration and definite tubercles may appear—definite evidence of tubercular disease of the kidney of the corresponding side. So, too, through the use of methylen blue or indigocarmin injections we can colour the urine blue and by observation of the orifices and a determination of the time taken for such coloration of the urine to occur we are frequently enabled to determine the affected kidney and to some extent to estimate the degree to which it is diseased.

But while such methods are of great use, and while in instances where bladder disease is widespread and we are unable to go farther and catheterize the ureters, we must depend on such examination, yet we feel that we should, where it is possible, go farther, and by making use of the ureteral catheter secure much more complete and accurate data on which to found our diagnosis. The objections raised are first, that one is liable to carry infection up the ureter and may thus infect a sound kidney. Secondly, it is difficult, or at least requires more skill than simple cystoscopy, and in addition causes the patient more discomfort.

To these objections it is perhaps best to reply in the light of one's own experience, which happily coincides with that of those who have given this practice a far wider trial. My experience then would show that the additional discomfort caused by catheterization is minimal, and that in our series of cases, now numbering some hundreds, we can find no single instance where infection of a sound kidney could be referred to our interference. It is therefore, especially, the use of the ureteral catheter and the so-called functional diagnosis, or determination of the functional capacity of the kidneys, to which we wish to call your attention to-day.

The means of measuring the function of the kidneys are the following: (1) the observation of the time required to excrete a given quantity of indigocarmin (e.g. 4 cc. 4% sol.) (Voelcker and Joseph) or methylen blue (Achard and Castaigne). This is given subcutaneously

and particular attention is paid to the time elapsing before the first discoloration occurs. (2) The determination of the time necessary for a given quantity of phlorizin to appear in the urine as sugar, and the period over which this glycosuria continues. Phlorizin has the property of circulating in the blood as phlorizin, but of being altered by the kidney cells to sugar. We have, therefore, a means of measuring the activity of the renal cells. The shorter the time required for sugar to appear, the greater the rapidity of secretion, the better the function of the kidney (Casper and Richter).

Other substances than those enumerated here have also been tried, but the above are the most important. Illyes and Kovesi, for example, endeavored to determine the elasticity or the capacity of the kidney to respond to a large increase in body fluid brought about by taking large quantities of water.

(3) The determination of the freezing point of urine ($\triangle$) and of the blood (δ) after Koranyi. This also plays an important part and is chiefly advocated by Kümmel and his associates. Relying on the fact that the freezing point of any liquid is depressed below that of distilled water according to the number of molecules which it contains, it offers a means of measuring the organic and inorganic molecules in the urine (or blood). Naturally, as the concentration of the urine varies from time to time so must the freezing point, but taken in conjunction with the freezing point of the blood, which is constant in health (—.56°), but which in renal insufficiency may be depressed even to —.65° or lower, it has, if we believe Kümmel's statements, proved a valuable means of avoiding death from uræmia in operative cases. To the same subdivision belongs the estimation of the electrical conductivity of blood and urine which fulfils the same purpose, while still further tests are the estimation of the toxicity and the quantity of chlorides and other salts.

In the earlier work all these tests were applied solely to the common urine—the bladder urine—with or without careful regulation and measurement of the foodstuff and water taken within a definite period of time, and many a complicated formula has been worked out to permit the observer to determine whether the renal function was sufficient to support life and whether the individual was in a position to bear any surgical interference with his renal secretion. It must be confessed, however, that apart from the information furnished by the determination of (δ) the freezing point of the blood we were still left much in the dark as to the actual state of the kidneys. Should, however, δ be below normal there was good reason to conclude that the kidneys' function was barely sufficient to sustain life and forbade any surgical interference. It is at this point that a very important point was brought into prominence

by Casper through his work with the ureteral catheter, a point soon recognized by other urologists and physiologists, viz., that in health both kidneys secrete urines which in all important points, such as acidity, specific gravity, amount of urea, chlorides and other salts and in their freezing point are practically identical, and that such kidneys excreted indigocarmin and secreted phlorizin as sugar in equal quantities and within the same period of time.

This was established not only by clinical experience after collection of the urine from the two kidneys simultaneously in a large number of cases, but also by animal experiment. We were enabled, therefore, by comparing the urine of one kidney with that of the other to determine whether a kidney was or was not diseased and to what extent the disease affected its function. A simple example will suffice. The first case is that of a woman who had an abdominal tumor. Examination was undertaken in order to exclude the kidney as the organ affected. The bladder and right and left urines showed the following values:

	Common or bladder Urine	Right	Left
Reaction	Acid	Acid	Acid
Sp. G.	1012	(1) 1015+ (2) 1018	(1) 1015 (2) 1018
Sediment	clear	clear	clear
Urea	—	1%	.8%
Alb.	0	0	0
Sugar		.25%	.25%
△	—	—	—
Mx.		Epithelium	
Culture	No growth	occasional r.b.c.	do

Both right and left urines were practically identical. Both kidneys are sound.

In the following example the values are very different. This was a case of tuberculosis, acute and rather extensive.

H. ♂ 17.09	Common	Right	Left
Amount	—	10 c.c. in 30′	6 c.c. in 30′
Reaction	Acid	Acid	Acid
Sp. G.	1016	1005	1020
Appearance	pale, turbid	pale, turbid	dark
Urea	—	0.1%	1.0%
Albumen	+	+	+
Sugar	—	0	2%
Mx.	pus T. bacilli	pus Many tubercle bacilli	epithelium r.b.c.

From this not only is the diagnosis clear, but we also know that the right kidney is doing but little to aid in the renal excretion of the body, as we have only to compare its work with that of the left, which shows no sign of disease.

This then is a tremendous aid, and when, as in the above example, we find no evidence of disease in the better kidney such as pus cells or blood,

where its specific gravity and urea content are within normal limits, we need not hesitate to conclude that such a kidney being sound we can do what we will with the sister organ.

There is still much to be desired, however, in the case of bilateral disease, where our examination shows both kidneys to be affected equally or unequally. Can we or can we not resort to surgical measures? Here we must reason somewhat as follows. First, if the discrepancy in secreting power is very great, if one kidney shows that it is secreting little else than water while the other is but slightly affected and doing most, if not all, the renal excretion of the body, then we can safely conclude that interference with, even removal of the worse kidney will have little effect. But, secondly, where we have two kidneys, both equally affected or nearly so, and especially when in addition the freezing point of the blood is lowered, we are forced to conclude that all the renal tissue is taxed to its utmost and any removal of the same will cause renal insufficiency and death. In such a case, therefore, if it be compulsory to operate we must content ourselves with simple incision and drainage, bilateral if necessary.

Separate urines can also be obtained by means of the segregator, and in certain instances we may be compelled to depend on this instrument, but in our opinion the danger of incomplete separation of the urines, to say nothing of contamination from the bladder, and in renal disease the bladder is always more or less affected, renders such urines too uncertain to permit of accurate conclusions.

This is perhaps the place to advance an answer to such questions as the following. Upon which test or tests do you place most reliance in estimating the functional power of the kidneys? Kümmel still holds by the freezing point, Casper by phlorizin, many by methylene blue, etc., Rousing to urea determination and specific gravity.

All these tests have given brilliant results, but such a statement as that just made is scarcely true. None of these men depend solely on one test. The most important diagnostic aid is a careful microscopical examination of the urine, then the other tests. It has been our custom to trust to no single test, but to draw our deductions from the *tout ensemble*. The specific gravity and urea content are always estimated. Freezing point and sugar content in most instances, indigocarmin rarely, and then only when special reasons call for it. Response to the induction of fluids is used somewhat more often. By taking the evidence supplied by all these tests a more correct idea is possible, each test may fail us for one reason or another, but it is rare that the failure of one is not corrected by the result supplied by the others.

The following cases will illustrate my remarks better than more extended discussion. I have curtailed the clinical history, both because of lack of time and in order to emphasize the objective findings which of themselves are sufficient to permit of a diagnosis.

(1) Acute hemorrhage nephritis bilateral:

L. ♂. aet. 30, 39.08, gave a history of persistent hæmaturia for one year. This varied in quantity. Albumen and casts were also present. Cystoscopy showed a normal bladder and ureteral catheterization the following:

	Common	Right	Left
Am't	—	10 c.c.	10 c.c.
Reaction	Acid	Acid	Acid
Sp. G.	1020	1024	1026
Sediment	bloody	turbid	turbid
Urea	—	2.1%	2.1%
Alb.	trace	+	+
Sugar	—	1%	1%
Mx.	r.b.c. hyaline & granular casts, no pus	r.b.c. blood casts Epithelial casts hyaline casts	r.b.c. blood casts hyaline casts with adherent r.b.c.
Culture	No growth		

Both kidneys were therefore equally diseased.

(2) Acute septic nephritis unilateral:

L. ♂. aet. 30, 93.07. Complained of attacks of right-sided pain resembling renal colic and a cloudy condition of the urine, which came on subsequently to the attacks and had persisted.

	Common	Right	Left
Am't	25 c.c.	10 c.c. in 45′	10 c.c. in 45′
Reaction	Acid	Alk.	Alk.
Sp. G.	1017	1015	1022
Appearance	straw color	pale	pale
Urea	—	1.2%	1.5%
Alb.	trace	+	0
Sugar	—	.25%	.5%
△	—	—1.03°C	—1.65°C
Mx.	pus bacteria few r.b.c. no T. B.	pus bacteria r.b.c. no T.B.	no pus 1 cast

This led to a diagnosis of right-sided acute pyelonephritis, the kidney tissue being evidently damaged. The X-ray failed to show a stone. The patient refused operation, but subsequently returned, when a second examination showed a temporary blockage of the right ureter. Operation revealed many adhesions about the kidney, thrombosis of both renal artery and vein and multiple small abscesses throughout cortex and medulla. The kidney was removed and the patient made an uninterrupted recovery. That such acute septic infections of the kidney can be diagnosed and that they may remain one sided and permit of removal and recovery is due entirely to the newer methods.

M. W. ♀. 27, 85.07, was a very similar case. She was taken ill with nausea and vomiting ten days previous to examination. Blood and pus occurred in the urine. Temperature 102 degrees. Examination showed:

	Common	Right	Left
Reaction	Acid	Acid	Acid
Sp. G.	1012	1012	1022
Appearance	turbid	turbid	blood stained
Urea	—	1.8%	2.6%
Alb.	+	++	trace
Sugar	—	.5%	1.5%
\	—	—.61°	—1.46°
Mx.	pus	much pus and bacilli	no pus or bacilli
Culture	B. Coli in pure culture		

The X-ray showed no stone.

A nephrotomy was performed and but little pathological was made out macroscopically. A snipping taken showed, however, acute septic inflammation though no actual breaking down had occurred. The patient did not do well and subsequent examination of the urines gave almost identical findings. Nephrectomy was therefore performed and the patient made a complete recovery. Pathological examination showed the whole kidney infiltrated with polymorphonuclear leucocytes, lymphoid and plasma cells forming small abscesses in places.

(3) Hydro- and pyo-nephrosis.

F. G. F. aet. 25. ♂. 61.09, has suffered from attacks of pyuria and chills over a period of several years. Pain was frequently felt in right loin and radiated to left testicle. Examination showed the following:

	Common	Right	Left
Reaction	Acid	Acid	Acid
Sp. G.	1022	1028	1010
Sediment	flocculent	no sed.	pale with floc. sed.
Alb.	?	0	tr.
Urea	—	3.6%	1%
Mx.	pus in small quantity	no pus	much pus & casts
		Flow normal in spirts	Flow steady drop by drop

Tubercle bacilli could not be found. The character of the flow from the left ureter indicated dilatation of ureter or pelvis about the end of catheter. Stone could only be partially excluded as an X-ray was impossible. There was evidently then a dilated pelvis with infection and considerable destruction of kidney tissue. Operation showed a large dilated pelvis and kidney with infection. The dilatation was caused by a malposition of the ureter and consequent kinking and obstruction. The patient recovered on nephrectomy.

T. ♀. aet. 40, 81.09, had suffered from pyuria for twelve years, along with rather infrequent spasms of pain. X-ray was negative. Examination showed:

	Common	Right	Left
Reaction	Acid	Alk.	Alk.
Appearance	turbid	turbid	clear
Sp. G.	1017	1005	1022
Urea	—	.25%	1.8%
Alb.	+	++	0
Mx.	pus	pus in great quantity	no pus
Culture	staphylococcus and B coli.		

No tubercle bacilli could be found.

Diagnosis:—Right sided pyonephrosis. Operation confirmed this diagnosis, little or no secreting tissue remained. The cause was evidently a kinking and obstruction of the ureter about six inches from its origin, where a definite constriction had occurred. Recovery after nephrectomy.

(4) Perinephritic abscess.

The following two cases are interesting as showing how a perinephritic abscess may affect the function of the kidney. Inasmuch as a few pus cells can frequently be found in the urine in such cases, and as such urines may give a culture corresponding to the type found in the abscess, there is ground to believe in an infection by direct contagion to the renal tissues, which are thus influenced in their secreting powers.

G. K., 16 ♀. 34.09, suffered from right sided severe pain for one week previous to admission to the hospital. She was sent in as a case of acute appendicitis and had a temperature of 102° F. No tenderness was present over the appendix, but this was marked in the right loin. Examination revealed the following:

	Common	Right	Left
Reaction	Acid	Acid	Acid
Sp. G.	1020	(a) 1020	(a) 1025
		(b) 1025	(b) 1030
Appearance	—	Slightly turbid	bloody
Urea	—	1.7%	1.9%
Alb.	0	+	0 (tr)
Sugar	—	.8%	.9%
Mx.	few r.b.c. pus cells	(r.b.c.)	(r.b.c.)

There was thus slight impairment of function without evidences of gross disease in the right kidney. This with the tenderness present suggested disease outside the kidney, but sufficient to influence its function. A diagnosis of perinephritic abscess was confirmed at operation and with drainage the patient completely recovered.

A somewhat similar case is the following:

T. W. G., 33 ♂. 2.09. Pain in the right loin had been present for one month. Tenderness was not marked at first, but later became more pronounced. Urine always showed some small amount of pus and occasionally hyaline casts. Catheterization of the ureters showed:

	Common	Right	Left
Reaction	Acid	Acid	Acid
Sp. G.	1027	1025	1028
Appearance	slightly turbid	clear?	clear
Urea	—	3.5%	3.8%
Alb.	—	0	0
Sugar	—	—	—
Mx.	pus	pus and hyaline	1 or 2 leukocytes
Culture	Staphylococcus	casts	

This led to a diagnosis of "small localized abscess or more likely perinephritic abscess." Tuberculin test and the X-ray did not help us. Operation showed a large perinephritic abscess from which a staphylococcus similar to that found in the urine was obtained. Drainage was followed by recovery.

(5) Nephrolithiasis.

In this class of case the stone is present as a cause or effect of the renal disease. Mrs. L., 35, 25th March, 1908, 41.08, had been treated for cystitis with lavage of the bladder for three or four months. She had occasionally had some right sided pain rather indefinite in character. On cystoscopic examination the bladder showed an intense cystitis, the left ureter voided clear urine, the right after a short time emitted some thick purulent urine. The right side was evidently the source of the disease, but could we remove the right kidney should this prove necessary and what was the nature of the disease? Ureteral catheterization showed:

	Common	Right	Left
Reaction	alkaline	alk.	alk.
Sp. G.	1018	1007	1036
Sediment	turbid	turbid	clear
Urea	—	1%	3.2%
Alb.	++	+++	+
Sugar	—	0	.5%
Mx.	pus	pus	no pus

It was therefore quite safe to remove the kidney should this be necessary. An X-ray was not taken owing to some changes in this department, but the diagnosis of calculous nephritis was made. Operation confirmed this, but while it showed the kidney very considerably damaged, it was not irretrievably so, and had not a persistent hemorrhage compelled us to do a nephrectomy we might well have left the kidney in situ. Knowing, however, that the other kidney was perfectly sound we had no hesitation in removing the kidney rather than run the risk of further hemorrhage. Recovery is complete.

R., 30 ♂ 18th March, 1909, 33.09, had had attacks simulating renal colic though not very definite in character. Ureteral catheterization and cystoscopy showed a well marked cystitis and the following values for the various urines:

	Common	Right	Left
Am't	—	10 c.c. (in 30)	25 c.c. (in 30′)
Sp. G.	1017	1013	1012
Reaction	alk.	neutral	alkaline
Sediment	thick flocculent	slight	thick
Urea	—	1.3%	1.1%
Alb.	0	0	trace
Sugar	—	—	—
Mx.	pus in quantity phosphates	epithelium	pus r.b.c.
Culture	large staphylococcus	no growth	Gram. neg. bacillus

X-ray gave a shadow.

Diagnosis: left-sided calculous nephritis. Operation confirmed the diagnosis. Nephrotomy, removal of calculus from the pelvis: drainage and recovery followed.

(6) The following case may serve as an example of renal tuberculosis which we have treated at greater length elsewhere. The chief points which demand attention are : (1) that the bladder is almost invariably affected, if not by actual disease, at least symptomatically, frequency, urgency and dysuria being extremely common if not constant; (2) that in the great majority of cases, tubercle bacilli can be demonstrated in the urine; (the failure to demonstrate T. B. after careful search has therefore a very definite value in renal diagnosis); (3) tuberculosis interferes very markedly with the renal function, even when not widespread.

E. McD., 27, 25th December, 1907, 112.07, had been ill for one year with frequency (every 1 1-2 hours during the day and 6 or 7 times at night), urgency, dysuria, hæmaturia, pyuria and loss of weight. The bladder was much inflamed, the left ureteral orifice slightly retracted and the ureter evidently tense as it caused a distinct ridge in its passage through the bladder wall. The urine values obtained by catheterization were:

	Common	Right	Left
Reaction	Acid	Acid	Alk.
Sp. G.	1012	1022	1004
Sediment	turbid	dark, clear	pale, turbid
Urea	—	2.4%	.5%
Alb.	trace	trace	+
Sugar	—	—	—
Δ	—	1.92.°	—.52
Mx.	pus few r.b.c.	no pus	much pus tubercle bacilli

Diagnosis: left sided tuberculosis. Operation. Nephrectomy showed a large kidney with tubercles everywhere throughout cortex and medulla. The patient made a very satisfactory recovery and has entirely lost his bladder and other symptoms.

(7) The next class of cases is that of new growths of the kidney, of which the hypernephroma is the only type I have yet met with from a functional point of view.

Mrs. G., 67, 20th March, 1908, 26.08, had had a tumor in left side of abdomen for a year or more. This had very evidently increased in size during the last month. Symptoms were not present. The urine showed a few pus and blood cells. The bladder was normal to cystoscopy and catheterization gave the following:

	Common	Right	Left
Reaction	Acid	Acid	
Sp. G.	1018	1026	no flow
Appearance	turbid	clear	
Urea	1.4%	1.4%	
Alb.	+	trace	
Sugar	0	.5%	
Mx.	few pus & r.b.c.	r.b.c.	

The tumor, complete suppression of urine on the affected side and the presence of blood with but little or no pus excluding pyonephrosis and tuberculosis enabled us to diagnose a Grawitz tumor, even apart from the rather indefinite history. Operation and removal confirmed the diagnosis. The patient recovered but eventually died from metastasis.

There is one other method which is of great importance in the diagnosis of certain renal diseases, viz., the X-rays, whose value may be seen in some of the above cases, but of which I only wish to say a few words. It is unnecessary to say that very considerable skill in the use of these rays is necessary to demonstrate calculus and even more to delineate the kidney in cases of hydro and pyonephrosis. It is not in my power at the present moment to quote figures of our own in this respect, but our experience is as follows. Where a stone has been present, as demonstrated by operation or autopsy, in most cases the X-rays have shown a shadow, but there are a few cases where the skiagram has lamentably failed to show a calculus. In no cases was a shadow shown which led to a diagnosis of stone without its being confirmed. A positive finding is therefore of great value, a negative finding is not. For a negative skiagram to be of value it must show not only the outlines of the muscles clearly, but also the outline of at least part of the kidney: in such a case a negative finding should have distinct weight.

To the ordinary skiagram must be added the skiagram taken when a metal bougie is in the ureter, and that taken when the renal pelvis and ureter have been filled with some non-penetrable solution such as collargol. The usefulness of the former is well demonstrated by Henry Fenwick in a volume which has just appeared and which is as yet the best book of its kind. The use of collargol in what has been termed pyelography was first advocated by Lichtenburg of Strassburg some two years ago with Prof. Voelcker. We have recently been working along these lines but our results are as yet too few to permit of generalizations.

These, however, as one can readily see, may be of exceptional value in certain cases, though up to the present the field of their usefulness has been limited. (Case XIV. is an example of ureteral stone pointed out by a bougie.)

If it is permitted one to repeat, we do not for one moment mean that our only reliance is in such methods. The older methods are as important to-day as ever they were. A careful history, a careful physical examination, careful palpation and inspection of the abdomen and external genitalia are, in the light of our present knowledge, even more important than formerly, and it must be confessed that occasionally all our diagnostic aids may fail us. (This, as far as it concerns the ureteral catheter, is usually the result of bladder or urethral disease.) Nevertheless we do feel that to-day it is unjustifiable that a patient should die from uræmia, renal insufficiency, following a surgical operation unless we have endeavoured to discover how much secreting tissue he has to carry him through.

It is perhaps unnecessary to add that since we have adhered to these methods we have not had to record a single instance of death from operation in kidney lesions.

EPITOME OF SUCCESSFUL EXPERIMENTS.

Experiment	*Type of Infection	Weight Initial	Weight Final	Date 1st treatment	Dose per kilo	Date recurrence	Dose	Remarks
X	+ + +	58	156	May 10	.2			No recurrence Oct. 20, 1909
XIV	+	75	117	May 11	.3			No recurrence "
				May 12	.2			
XXVI	+ +	72	96	June 10	.3			No recurrence "
XXVII	+ +	122	134	June 10	.4			No recurrence "
Giii	+ + + +	80	105	June 10	.2	July 14	.4	Single recurrence, 34 days
XVI	+ +	78	115	May 10	.2	Aug. 5	.2	" " 85 "
XIII	+	71	146	May 7	.2	Aug. 13	.2	2 recurrences, 98 and 110 days
						Aug. 25		
XVII	+ +	91	148	May 10	.3	June 5	.3	4 recurrences
				May 12	3	June 16	.3	No subsequent recurrence
						July 8	.3	Oct. 20, 1909
						July 20	.3	

*+ Trypanosomes present. + + Several in one field. + + + Many in one field. + + + + Crowded fields.

THE WASSERMANN REACTION IN SYPHILIS.

BY

WM. HUTCHINSON, M.D.

Syphilis, a disease which has been known since the days of Hippocrates, which has had its habitat in the most civilized countries of the world, which has been studied by scientific medical men for centuries, has, until recently, baffled all attempts to discover its cause or to reproduce it in the lower animals.

In the last few years, however, tremendous advances have been made in the work upon it. The first was the discovery of the Spirochæta Pallida which, although not fulfilling all of Koch's postulates, can be said to be the cause of the disease. The next was the discovery that a certain species of ape would react to the organism of syphilis in the same manner as does man, and thus enlarging enormously the boundaries of research work. Then came the clinical observation that the disease could be contracted more than once. And last of all has come the syphilitic serum reaction.

It is the object of this paper to point out the scientific and practical importance of this last discovery.

In the year 1901 Bordet and Geugon (1, 2, 3) discovered that the combination of an extract made from the pure culture of a given bacillus with the serum of a patient suffering from the disease caused by this bacillus produced a third substance. This end product, they found, had the power of combining with the complement and thus preventing hæmolysis. Following this discovery many investigations were carried out along this line. Thus many of the infectious diseases were thoroughly investigated with very good results. The works of Moreschi, (4) Wassermann and Leuch (5) are the most interesting in this department. It was while working along these lines that Wassermann conceived the idea of applying it to syphilis. He was, however, at the very outset confronted with a difficulty. Up to the present day a method of growing the Spirochæta Pallida has not been discovered. Therefore he had to look about for some other means of obtaining the extract. This he found in the liver of a syphilitic fœtus. As is known, the liver of such a fœtus contains large numbers of spirochætæ, and it was reasonable to suppose that this body (toxin or antigene) would be present in that organ. He therefore made an extract from such a liver and was rewarded by obtaining results just as satisfactory as in the case of the other bacteria. Naturally the first question which presents itself is: What is the antigene? Is it the product of the bodies of the spirochætæ? Is it a chemi-

cal substance produced by the action of the spirochætæ on the tissues? Is it merely a chemical substance found alike in normal and syphilitic organs?

Many investigations have been carried out in an attempt to answer these questions, but up to the present day no satisfactory conclusion has been arrived at. Some investigators used normal organs and found that if large quantities were used the reaction was obtained (Bruch and M. Stein). (6) Others dissolved a portion of this extract in alcohol and separated the soluble from the insoluble portion. They discovered that when they used the insoluble part without the alcohol-soluble one the reaction did not take place. On the other hand, when they used the alcohol-soluble portion they obtained the reaction. Therefore the conclusion they came to was that, whatever this substance might be, it was an alcohol-soluble one. (Porges and Neisser, (8) Landsteiner, Müller and Pötzel.) (7)

A substance which was found in considerable quantities in these organs was Lecithin, and being soluble in alcohol it was suggested that this might be the one. It was and is still being tried in many places, but the results are not unanimous. Some report favourable results from it whilst others are not at all optimistic. Besides lecithin, many other substances have been suggested, such as the bile-acid salts (Levaditi), (9) Vaseline, Taurocholate and Glycocholate of sodium and sodium oleate (Levaditi and Yamarchi). (9) All these substances have their advocates, but none of them have been found to be perfectly reliable. If some such substance could be found to be absolutely reliable it would overcome one great difficulty, that of obtaining syphilitic livers. However, we must admit, that whether this substance is a chemical compound or some body in the liver, it is undoubtedly increased by the action of the spirochætæ on the tissues. This being so, it is reasonable to suppose that it would be present also in syphilitic lesions. Neisser, Bruch and Schucht (11) examined a number of lesions and obtained the following results:—Five primary sores gave five positive reactions; nine condylomata lata gave eight positive; five tertiary lesions gave five positive; seven brains of paralytics gave seven positive; fourteen nonsyphilitic tissues gave fourteen negative reactions. Thus it is quite clear that the tissues affected by this virus contain a large quantity of the antigene.

A rather interesting experiment was performed along these lines. A scraping, containing a number of spirochætæ, was placed in a collodion sac. This was then closed and put into the peritoneal cavity of a rabbit. In two days a specific antigene was obtained from the blood of this rabbit.

Taking all these facts into consideration we must conclude that the antigene is not found in the body of the Spirochætæ Pallida, but is present in small quantities in normal organs. On the other hand, we are not able to state what this antigene really is, but can only say that it is some substance which is present in small quantities in normal organs and is increased by the action of the Spirochæta Pallida. We must, however, admit that it can be simulated, to a certain extent, by lecithin and the soaps.

Leaving the antigene we turn to the consideration of the other substance which enters into the reaction, namely, the syphilitic antibody. In considering this body there are two questions which require an answer: the first is that which concerns its nature and the second is its right to be designated syphilitic antibody. In attempting to answer the first question we are as much at sea as in the case of the antigene. There is only one thing which can, with any probability of accuracy, be stated. This is that the antibody is allied to the antitoxin produced in the body in order to combat the toxins thrown out by bacteria. To put it in a simple form, the bacteria during their life-cycle produce a substance which is injurious to the organism, and this causes the organism to react in order to protect itself against the effects of this toxin. The result is the production of the antibody or antitoxin in the organism.

In the second place if we call this substance the "syphilitic antibody," that implies that it is found in syphilis, and in syphilis to the exclusion of all other diseases. That it is found in syphilis has certainly been proven, but not that it is present in every case of syphilis. When the test was first applied only 45 to 50 per cent. of the cases gave a positive reaction, but as the technique became improved 80 to 100 per cent. reacted. Lately Wassermann (12) has examined 1,000 cases and found it positive in 90 per cent. One must, however, remember that many things have to be taken into consideration. The stage of the disease plays a very important part; the second stage gives 80 to 100 per cent. of positive reactions whilst the percentage is smaller in both the primary and tertiary stages. Then again the condition of the patient has some bearing on the matter. This is quite apparent when we consider the reason for the production of this antibody. If the dose of the toxin be very powerful the body may not be able to react at first; or again if the patient be in a very debilitated condition he would be unable to react sufficiently. The next question to be answered is: Do we obtain a reaction in any other disease than syphilis?

In order to answer this question workers upon the serum reaction examined numerous cases of all classes of "bacillary infections." Schulze

(13) in his early work found two cases which gave a positive reaction but in which no trace of syphilis could be found. These, however, were put down to faulty technique. Wassermann examined 1,000 cases made up of many classes of diseases, and found that everyone turned out negative. The same results have been obtained by many others. In discussing the question I used the term "bacillary infections." This was done purposely on account of the work done by Fraenkel and Much (14) on the reaction in "sleeping sickness" and also that done by Much and Eichelberg (15) in "scarlet fever." These men obtained a very fair percentage of positives in scarlet fever by using the syphilitic antigene.

Let us now turn to the consideration of the clinical side of the reaction and see what all these investigations have led to. For after all, any work done by the bacteriologist, no matter how interesting from a scientific point of view, must have a practical side to it in order to appeal to the practitioner. In the case of the serum reaction in syphilis we feel that we have a method of diagnosis which is intensely practical. By that I do not mean one which every practitioner can do in his office, but one which gives him valuable assistance both in the diagnosis and the treatment of syphilis.

That the diagnosis may very frequently be difficult, and sometimes impossible, to make is a fact too well known to need mention. This uncertainty commences in the very earliest stage of the disease and follows one to the last stage both of the disease and of the patient, and may even be found beyond that in the autopsy room.

Let us take up first the early diagnosis of syphilis, for here, probably, the greatest difficulty is encountered. How often are practitioners confronted with a lesion of the genitals concerning which they could say nothing definite, as to whether it was or was not syphilis? Here, at once, is one of the greatest problems which has to be faced. What is to be done for the patient and what are we to tell him? Are we to place him on antisyphilitic treatment and condemn him to a prolonged course of mercury and the iodides and a life of suspense? Or must we admit that we do not know what the condition is and wait for secondaries to develop? What then have the modern methods to offer as a solution to this problem?

The *spirochæta pallida,* if it be discovered in a lesion, possesses, as we now believe, a diagnostic value equal to that of the tubercle bacillus in tuberculosis. This has been made quite simple by an invention of Reichert's, whereby the spirochætæ are examined in a dark field in a living condition. In the next place we have the serum reaction to tell us whether the disease is local or general. Noguchi in his latest work

obtained seven positive reactions in seven cases of primary syphilis. However, other men have not obtained such a large percentage, but it may be that the technique as improved by Noguchi would bring their percentages higher. I think we can justly say that the newer methods have done a great deal to solve these problems. I do not say that all cases will be satisfactorily cleared up, but certainly a very large percentage will be. When we come to the secondary stage the difficulties are not so great. There are, however, some lesions which are not easy of diagnosis. It is in this stage that the greatest percentage of positive reactions is to be found. This ranges anywhere from 80 to 100 per cent.

In the tertiary stage there are many obscure lesions which can be rapidly cleared up by means of this method. The percentage of positive reactions is not so high as in the secondary stage, nevertheless with improvements in technique the percentage, in this stage also, is increasing.

Having dealt with the three stages of syphilis we must now consider a class of diseases which has been termed "Parasyphilis." This comprises two diseases of the nervous system, namely, *tabes dorsalis* and *general paresis*. Long before Wassermann discovered the serum reaction, clinicians came to look upon these as having some connection with syphilis. For they found that a large percentage of cases gave evidence, either in the anamnesis or in the examination of pre-existing syphilis. There were, however, a number of cases in which this could not be detected. Since the advent of the modern methods of investigation many of these have been cleared up. Out of 233 cases collected from the literature 194 gave a positive reaction and 39 gave a negative one. Later Noguchi (16) reported 11 cases of tabes dorsalis, all of which gave a positive reaction. These statistics are interesting in that they include a number of cases which gave no evidence of syphilis and therefore would have passed into the literature as cases of tabes dorsalis without lues. Of course, this only proves that an antibody to syphilis exists in the patient and not that these diseases are caused by it directly. Have we then any means of determining whether there exists an active syphilis in the central nervous system? It was suggested that if an organ contained a strong antibody that that organ must be the seat of an active lues. An attempt was therefore made to prove that the antibody was stronger in the cerebrospinal fluid than in the blood serum. The experiments did not bear out this theory as in most cases the reaction was quite as good with the use of the serum as with the cerebrospinal fluid. As the attempt to solve the problem by means of the antibody failed, some other method had to be looked for. This was found in the proof of the existence of the antigene in the brain and spinal cord of paretics and tabetics.

Neisser (17) obtained the antigene from the brains of seven general paretics. If, now, the antigene cannot be obtained from the normal brains, we must conclude that there is an active syphilis in the central nervous system. There is not sufficient material yet to draw any definite conclusions, but we hope in the near future to be able to make some statement along this line.

As syphilis is a disease which does not confine itself to any one organ or produce merely general symptoms, but may affect every organ in the body, it has therefore a particular interest for each specialist as well as for the general practitioner. The ophthalmological department has been greatly aided by the serum reaction. There are cases which interest the ophthalmologist on account of direct involvement of the eye and there are those which affect it indirectly. These are the ocular manifestations of brain lesions.

In the first group are classed the cases of luetic iritis and keratitis (parenchymatous); in the second such as show optic neuritis, disturbances in the field of vision, and paralysis of the eye muscles. Cohen's (18) article is of particular interest in pointing out the benefit of the reaction in such diseases. He found 23 cases giving a positive reaction, but of these, eight were definitely of syphilitic origin, and therefore not of particular interest. In the other fifteen, however, no clinical evidence of syphilis was present. These cases show the great benefit to be derived from the reaction, not only in arriving at a diagnosis, but in pointing out the line of treatment to be followed. Then in the cases of optic neuritis from brain tumors it must be apparent to all that the sooner a diagnosis is arrived at and the proper line of treatment carried out, the better for the patient. In this way a loss of vision may be avoided.

Although in those cases in which a negative reaction is obtained, we are not able to say definitely that the lesion is non-syphilitic, yet it, at least, is of value in suggesting further investigation along other lines. For instance the tuberculin test would be in order or an exploratory operation which would at the same time be a decompressive one.

Next let us mention a few of the other diseases which look to the serum reaction for aid. These are tumors of the tongue and pharynx, enlargements of the liver, glandular enlargements, orchitis fibrosa, stricture of the rectum, aortic aneurysm and mediastinal tumors. The papers written by Citron, (19) Fritz Lesser, (20) Frænchel and Much (21) are of particular interest along this line.

We come now to consider the reaction in relation to prognosis. The two questions that require an answer in the prognosis of a disease such as syphilis are: first as to the severity of the particular case, and sec-

ondly as to whether a cure has been effected. If, therefore, the reaction can be said to have any value in the prognosis of syphilis it must give an answer to these questions. In the case of the first of these the results are not very satisfactory. If the case is being seen for the first time, and no treatment has been given, then the results are not of much value. The explanation is found in the way that the antibody is formed. Let us take, for example, a man who is very weak, that is, whose body is unable to react properly and form antibodies; this man will probably give a weak reaction and yet run a very severe course of syphilis. On the other hand, we see cases in which a strong reaction is obtained, but the symptoms are very mild. However, there is a definite field in which the serum reaction is of considerable prognostic value, that is, in estimating the effect of treatment. Most observers have found that mercurial treatment affects the reaction. Those cases which were strongly positive before treatment became weaker and weaker after each treatment and finally became negative. The articles of Citron (22) and Schulze (23) are the most interesting on this subject. The last named author found 25 cases positive out of 27 not treated; 8 positive out of 12 cases having had one treatment; 1 positive out of 5 cases having had more than one treatment. Citron, along with the majority of others, considers the prognosis as very bad in those cases that do not show a decided weakening in the reaction under treatment.

In answering the second question we must divide it, at least at the present day, into two sections. The first includes the ordinary three stages and the second the parasyphilitic stage.

When a patient comes to the physician stating that he has had syphilis but that he has not had any symptoms for some time, and when in such a case the reaction is found positive, what is to be said? Is the patient still the subject of an active syphilis which is lying dormant, or is this merely the result of the antibodies thrown out to counteract the old attack which has not yet died away? In order to answer this question one must decide how long the antibodies remain in the serum after a cure has taken place. Citron places the time at three months and believes that a positive reaction means that the patient either has an active syphilis or has had one within the last three months.

On the other hand, what are we to say concerning a negative reaction? In other words does a negative reaction prove that a cure has taken place? Unfortunately a few cases which gave a negative reaction showed tertiary symptoms later. However, I think that when two or three tests turn out negative one is justified in saying that a cure has been effected.

In respect to the parasyphilitic stage we are obliged to admit that it is too early to state anything definite, but only to recommend that cases giving a negative reaction should be kept track of in order to see whether they develop general paresis or tabes dorsalis. We will now briefly consider the relation of the serum reaction to the treatment of syphilis. In the primary stage a positive reaction will indicate the commencement of the treatment and therefore time is not lost in waiting for secondaries to develop. Then there are those who have gone through the ordinary treatment and wish to know whether another course of treatment is necessary. If a positive reaction is obtained then another one is certainly indicated, but if, after a lapse of three months from the time of the last course, a negative reaction is found they might be allowed to go as cured.

In conclusion I might say that a positive reaction is proof either of an existing active syphilis or one which has been active within the last three months. On the other hand, a negative reaction cannot be said to be an absolute proof of the non-existence of syphilis. If, however, a patient has had no symptoms for some time, and if two or three tests give a negative reaction, one is justified in concluding that a cure has been effected.

Technique.—As there are five factors which enter into the reaction, it is important not only to know how they combine with one another, but also how each is obtained.

1. *Serum.*—This is obtained by inserting an ordinary exploratory needle into one of the superficial veins of the forearm. In this manner 10 c.c. of blood is withdrawn and immediately centrifugalized. The serum is then drawn off and inactivated in a water-bath at a temperature of 56° C. for ½ hour. By inactivation is meant the destroying of the complement for the reason that the human complement varies in different individuals, as to quantity, and therefore a known quantity must be added each time.

2. *Extract.* a. *Alcoholic.*—The liver of a syphilitic fœtus is cut up and ten volumes of absolute alcohol is added and the whole shaken for 24 hours. When the tests are to be made it is shaken up and a small quantity drawn off and centrifugalized. To the clear fluid 4 volumes of normal saline is added and then it is ready for use.

b. *Watery.*—The liver is cut up as before and four volumes of a ½ per cent. solution of carbolic acid in normal saline is added. This is then shaken 24 hours and when needed a small quantity is withdrawn and centrifugalized.

Both these extracts should be kept in the ice-box, but should not be frozen.

3. *Complement.*—As a complement the serum of a guinea-pig is used for the reason that it has been found by experiment that all guinea-pigs' serum contains the same strength of complement.

4. *Amboceptor.*—This is obtained by injecting 5 c.c. of washed sheep blood-cells either intravenously or intraperitoneally into a rabbit. At the end of 10 days some of the blood is withdrawn and centrifugalized. The serum is then drawn off and inactivated in the same manner as was previously described. The amboceptor must be tested as to its strength.

5. *Blood-cells.*—If the amboceptor has been prepared for sheep's blood, then the blood-cells of the sheep must be used for the test. This is collected, defibrinated and washed. Then a five per cent. solution of these washed cells is used.

Having prepared and tested these various factors one proceeds as follows:—

	Serum	Extract	Complement		Amboceptor	Sheep's blood 5%	Result
1	0.2	0.1	0.1	1 hour at 37° c.	0.025	1 c.c.	No hæmolysis
2	0.2	0.05	0.1		0.025	1 c.c.	Partial hæmolysis
3	0.4	—	0.1		0.025	1 c.c.	Complete hæmolysis
4	0.2	—	0.1		0.025	1 c.c.	Complete hæmolysis
5	—	0.2	0.1		0.025	1 c.c.	Complete hæmolysis
6	—	0.1	0.1		0.025	1 c.c.	Complete hæmolysis
7	—	0.05	0.1		0.025	1 c.c.	Complete hæmolysis
8	—	—	0.1		0.025	1 c.c.	Complete hæmolysis
9	—	—	—		0.025	1 c.c.	No hæmolysis

The volume is made up to 5 c.c. with normal saline.

Nos. 1 and 2 are the tests. Nos. 3 and 4 are controls for the serum. Nos. 5, 6 and 7 are controls for the extract. No. 8 is usual hæmolytic test. No. 9 controls the amboceptor.

When a number of tests are done on the same day Nos. 5, 6, 7, 8 and 9 need only be done once.

Noguchi has modified the reaction in the following manner:—

He used an amboceptor to human blood-cells instead of one for sheep's blood. He found that some human sera contained an amboceptor to sheep's blood whereas others did not. In this way there would be more amboceptor in one test than in another. Thus by using human blood-

cells he did away with that fallacy, for certainly human serum does not contain an amboceptor to human blood-cells. He employs six test-tubes. Into the first two he puts one drop of the patient's serum; in the second two, one drop of a serum which is known to contain the syphilitic antibody; in the third two, one drop of normal serum. Into each tube he then runs 1 c.c. of a suspension of human blood-cells in normal saline (one drop of blood to four c.c. of normal saline). Then he puts 0.04 c.c. of complement into each one and into the first of each pair one drop of the extract. The rack containing the test-tubes is placed in the incubator at 37° C. and left there for one hour. At the end of that time two units of amboceptor are added to each tube and they are put back into the incubator for two hours longer. They are then placed in the ice-chest for 12 hours. The method of reading off the reaction is the same as in the Wassermann reaction.

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THE ANATOMICAL ASPECT OF FRACTURES.

BY

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(Read before the McGill Medical Society.)

The study of fractures seems at first to be exceedingly complex and difficult. We see an elderly woman at the hospital, whose hip is much swollen and very painful. That her leg is everted, shortened perhaps and cannot be raised, has no particular and distinctive significance to us, and we marvel at the house surgeon's skill in diagnosis when we learn that she has sustained an intracapsular fracture of the neck of the femur. We do not realize that her age, sex, mode of injury, the eversion of the foot and shortening of the leg, all point to the above-mentioned lesion. And yet the study of fractures depends largely on the acquisition of signs or symptoms, analogous to the "tips" we learnt in the dissecting room, by which we are able to tell at what point a bone has been broken, where the fragments are and how to reduce the deformity. To show that these signs or symptoms are not present by chance, but depend very largely on the anatomical relations of the bone in question, is the object of my paper to-night.

To begin with, it must be admitted that the continuance of the force producing the fracture plays a part in some cases, as for instance in causing an impacted fracture at the wrist, and even the effect of gravity must not be overlooked in studying the signs in any given case.

A direct fracture is where the bone breaks at the spot where the force was applied. When the fracture takes place remote from the seat of violence, the term indirect fracture is employed. The latter is well exemplified by a child who fell on its outstretched hand and broke its clavicle.

When violence is applied to a bone it generally searches out the weak places, and in one or more of these the fracture occurs. In a long bone there are two weak points, one being the cartilaginous junction between epiphysis and diaphysis, and the other being the spot where the dense bone of the shaft meets the soft cancellous expanded extremity. Epiphyseal separations, as fractures through the epiphyseal cartilage are termed, occur somewhat infrequently. We should see them much oftener were it not that the epiphyseal cartilage is so close to the end of the bone that it is not only protected to a greater or less extent by the ligaments, but does not give the breaking force much chance to act upon it. If this same cartilaginous junction were toward the middle of the shaft, practically all fractures of long bones would be epiphyseal separations.

The second weak spot mentioned, the junction of the hard bony shaft with its softer cancellous extremity, furnishes the greater number of our typical fractures. We see examples of it in the Colles' fracture just above the wrist joint, and in fracture of the surgical neck of the humerus. Such fractures are often associated with impaction, the hard shaft being driven by the force of the accident into the softer extremity of the bone.

Fractures are naturally most frequent during the period of active life, and some forms are commoner in old age than in youth, owing to the loss of the organic constituents of bone in the process of senile atrophy. Bones that are well padded are not often seen fractured, unless, like the femur and radius, they are so situated as to be continually receiving violence from below.

We learn in physiology that muscles are in a constant state of tonus or tension, and nowhere, I think, do we see this more clearly exemplified than in fractures. Let a man knock his elbow, breaking off the olecranon process, and immediately the triceps pulls and pulls upwards, until that separated piece of bone, into which this muscle is inserted, has been displaced upwards to a considerable degree. We must conceive of a bone, especially a long one, as constantly holding its own against the opposing pull of muscles or groups of muscles, the flexors pulling against extensors, the abductors against adductors, and so on. When a fracture occurs each fragment is at the mercy of the strongest muscle or set of muscles attached to it, and that fragment, like the olecranon mentioned above, will act accordingly.

By this we see how much importance is attached to a knowledge of the insertion and action of the muscles attached to a bone. The study of osteology certainly is not limited to an acquaintance with its ridges, grooves, and depressions alone. In addition, the bony landmarks need attention, and while in a dissecting room grind one may fail to see the value of Nélaton's line, in fractures and dislocations around the hip it is of great service. Many other points might be mentioned as being of value from a surgical standpoint, as for instance what important structures lie near the bone at favorite seats of fracture, the manner in which a bone grows old, and so on. As regards the first, a good example is found in the musculospiral nerve, which following fractures of the shaft of the humerus is frequently involved in the callus thrown out, thus producing paralysis. A knowledge of these anatomical points will give us valuable information as to the probable seat of fracture, and, as Helferich puts it, "Speed and accuracy of reduction depend on a knowledge of the typical displacement."

The clavicle is a slender bone, exposed along its whole length. It acts normally as a brace, keeping the shoulder off at a proper distance from the body. The pectorals tend to draw the shoulder inwards, as does the trapezius. Imagine a boy falling and landing on the point of his shoulder. The force is at once transmitted to the clavicle, and as the sternal end is tightly held and is not easily dislocated, the bone will probably break near its middle at the junction of its two curves, the weakest point. The bracing action is immediately destroyed, and the shoulder is pulled inwards by the pectorals, at the same time drooping by its own weight. The axillary space seems lost. The sternomastoid usually manages to displace the inner fragment somewhat upwards. Almost immediately underneath the seat of fracture run the axillary vessels and the cords of the brachial plexus, but fortunately these are well protected by the subclavius muscle. In setting the fracture we endeavor, as far as possible, to correct the deformity by pulling the shoulder backward and upward, fixing it there, and keeping it away from the side by the use of an axillary pad.

The scapula is well padded, front and back, and is, in addition, freely movable. Fractures of it are accordingly rare, and when they occur are generally due to direct violence.

Fractures of the lower jaw behave in a very typical manner. When the horizontal ramus is broken (and this is not uncommon), the posterior fragment is held tightly against the upper jaw by the masseter, temporals and pterygoids. The anterior part, with the point of the chin, is pulled downwards by its own weight, aided by the digastric, mylohyoid, and other muscles attached to the chin. The condition is thus an easy one to recognize. The dressing we apply must, of course, aim at pulling the anterior fragment upwards to its place alongside the posterior part.

The fractures most commonly met with in the humerus are those of the surgical neck, of the shaft, and a transverse fracture of the lower end above the condyles. Fracture of the surgical neck is quite a common form of injury around the shoulder. In people under 20 it may take the form of separation of the epiphysis, for, as above, the cartilage uniting the head with the shaft is a weak point. The bone is broken just below the tuberosities, and hence the three external rotators (supraspinatus, infraspinatus and teres minor) attached to the greater tuberosity will twist the head outwards. The shaft of the bone is drawn upwards by the powerful muscles of the arm, and somewhat inwards by the pectoralis major and its group inserted into and beside the bicipital groove. In consequence the upper end of the lower fragment is often

displaced into the axilla, or can be seen under the coracoid process, the deformity resembling subcoracoid dislocation of the head of the humerus.

In fractures of the shaft of the humerus the important factors are the strong biceps, triceps, etc., which tend to produce overriding by their tension, the pectoralis and teres major with the latissimus dorsi, attached just below the tuberosities, and the deltoid, inserted on the outside, about half-way down the shaft. When the fracture occurs just below the insertion of the adductors around the bicipital groove, the upper fragment is, of course, adducted, while the lower one is dragged upwards outside this by the deltoid, producing considerable shortening. If, on the other hand, the fracture is below the middle of the shaft, the deltoid overpowers the pectoralis major and its confrères, raising the upper fragment outwards, while the biceps and triceps drag up the lower part, with the elbow. As before, the callus sometimes involves the musculospiral nerve as it hugs the bone, paralysing the extensors of the wrist and fingers, which produces the well-known "wrist drop."

In transverse fractures at the lower end of the humerus above the condyles, the deformity is simple. The lower fragment, carrying the condyles and the elbow joint, is dragged upwards and backwards by the triceps, while the lower end of the upper fragment projects in front of the joint. The deformity resembles somewhat a dislocation of the radius and ulna backwards, but on examination it will be found that the condyles of the humerus are, with the arm extended, still in a straight line with the tip of the olecranon, in flexion forming a triangle. These normal relations are, of course, disturbed in a dislocation at the elbow.

Although the ulna is exposed along its posterior border, it is not often fractured alone. When this does happen it is generally the olecranon process that is knocked off, or else the shaft is broken in warding off a blow with the arm.

The radius is frequently fractured, the explanation being that it receives all violence applied to the hand in an upward direction, as a fall on the outstretched palm. This is the commonest cause of an accident, and may produce a Colles' fracture, called by the Germans a typical fracture of the radius. In this, a fracture of the lower end of the bone from half an inch to an inch above the wrist joint, the deformity is considerable, and in this fracture is largely produced by the fall which caused it. The seat of fracture marks the point where the hard shaft joins the softer cancellous end of the bone, and in many cases the former is driven into the latter, producing impaction. The shortening of the radius, aided by the pull of the supinator longus, helps to evert the hand, the strong extensor tendons drag the small lower fragment (to which the

hand is attached) upward and backward, and the pronator quadratus approximates the lower end of the upper fragment to the ulna.

When the shaft of the radius is broken the actions of the supinator longus and brevis and of the pronator teres must be noted. If the fracture takes place above the middle of the bone, that is above the insertion of the pronator teres, the upper fragment will certainly be rotated outwards by the biceps and the supinator brevis, for these muscles are unopposed by any pronator. Now it is a law in surgery that when you cannot make one fragment assume the position you want, you do the next best thing by placing the other fragment, which presumably is under control, in line with the first. Since, therefore, we cannot pronate the upper end of the radius, as it lies deeply buried in muscles, we supinate the arm and so put up the fracture.

When the bone is broken below the insertion of the pronator teres, the above mentioned supinators are balanced by it, though the pronator tends to draw the upper fragment of the radius toward the ulna. The pronator quadratus is doing the same thing with the lower fragment, so that we must be on our guard against callus formation from radius to ulna across the interosseous membrane. As the upper fragment lies presumably between pro- and supination, and in this position of the hand the radius and ulna are most widely separated, we dress the fracture thus, with the thumb up, being careful not to bandage the bones tightly together.

In advancing years bones undergo senile atrophy. This takes the form of loss of the organic substance of the bone, increase in the fat, so that the bone has a greasy look, and increase in the size of the medullary cavity. All this tends to make them weaker and more brittle. The femur shows this senile change more than most bones, and in women an additional point is to be noted, that the angle of the neck of the femur with the shaft more nearly approaches 90 degrees. The weakest point in the bone is where the compact tissue of the neck joins the softer expanded and globular head. In old people this is quite weak, and in old ladies especially, for the reason given above, a misstep is often the cause of a fractured neck of the femur, quite near the head and generally inside the capsule of the hip joint. This is accordingly termed an intracapsular fracture of the neck of the femur.

When this has happened, at once everything tends to produce eversion of the leg, which simply rolls over, principally by its own weight, but aided by the external rotators, the obturators, quadratus, pyriformis, etc. The only blood supply now left the head is that which enters by the ligamentum teres. This is quite insufficient for bone formation, and

so we generally get union by fibrous tissue, and the formation of a new joint where the fracture occurred.

The shaft of the femur is, with children especially, a favorite site of fracture. The deformity produced by a break in the upper third of the shaft, somewhat below the trochanters, is very characteristic. The chief part is played by the ilio-psoas, which is the principal flexor of the thigh on the abdomen, acting on the lesser trochanter and below it. This muscle strongly flexes the upper fragment, so that as a rule the end of the bone causes a projection in front of the thigh that can be seen and felt. The glutei at the same time abduct it to some extent, while the main portion of the bone is drawn powerfully upwards and inwards by the hamstrings, quadriceps femoris, and adductors. As the upper fragment cannot usually be brought down, we are forced to follow the rule and make the lower fragment assume a flexed position also.

In fracture of the lower end of the femur, the powerful calf muscles (gastrocnemii) attached to the condyles flex the lower fragment backwards into the popliteal space. This is of necessity in dangerous proximity to the popliteal vessels and nerves. To avoid trouble with these important structures, as we are not able to extend the lower fragment, we put the leg up with the knee flexed. In this way the deformity is overcome and the two fragments assume the same straight line.

When the patella is fractured in a stellate or vertical manner there is little displacement, for almost all the force exerted upon this large sesamoid bone is in a vertical direction. At first sight it would seem that the patella would only have to be broken transversely for the fragments to separate widely. But this is not the case, the amount of separation depending very largely upon the degree of laceration of the capsule of the knee joint. When this has been extensive there is usually much separation of the patellar fragments and not often are these able to be closely approximated short of wiring. Unless this approximation *is* close one does not get bony, but fibrous union.

Fractures of the leg do not present anything particularly novel in their anatomical relations. What has, however imperfectly, been given will, I think, serve to show the important rôle that anatomy plays in the study of fractures.

SOME MUSEUM METHODS OBSERVED IN THE PRINCIPAL PATHOLOGICAL MUSEUMS OF LONDON.

BY

J. KAUFMANN, M.D.,

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While looking through the principal Medical Museums of London, I was greatly impressed by the various methods at the disposal of the laboratory directors for mounting and preserving moist and dry specimens, preserving colours in fresh post-mortem material, and various other proceedings of considerable interest to museum workers.

Most of my information comes from the Museum of the Royal College of Surgeons, where under the kind supervision of Professor Arthur Keith, Curator of the Museum, I was enabled to spend two very profitable days. I devoted one afternoon to the preparation laboratories of the Museum with the chief laboratory man, observing how the work was being carried on, paying special attention to mica mounting of delicate moist specimens, to some corrosion methods, and to a method for softening bones so that they may be cut with a knife.

I spent some time at the Museum of St. Bartholomew's Hospital with Drs. Branson and Thursfield, observing especially their results with the Paraffin-Glycerine method of preserving moist specimens, a method for preserving gouty deposits in tissues, and a method for showing extension of a new growth in thin sections and the sharp definition between cartilage and bone adjoining each other; at the Museum of the London Hospital with Dr. Russell Howard, observing their method of gelatine mounting of specimens and sealing of museum jars; and at the Museum of Charing Cross Hospital with Dr. Forsyth, especially noting their method of numbering and preserving specimens and also their general system of cataloguing.

I also spent some time observing the specimens and the work in the beautifully kept and equipped Museums of Guys and St. Thomas Hospital Medical Schools.

The following is an abstract of notes made at the time:—

Preserving Fluids:—Ten per cent. formalin is the most commonly used hardening and fixing solution. The colours are brought back with 50-75 per cent. alcohol and the specimens are finally kept in 50 per cent. glycerine. For the prevention of moulds a small quantity of formalin or a small piece of thymol is added to the 50 per cent. glycerine; both are very efficient, but the latter tends to render the fluid somewhat turbid and is therefore not being used very widely where an absolutely

clear fluid is required. Kaiserling's method of fixing and preserving specimens is very little used.

Gelatine is very little used as a preserving medium; where it is used there is a great deal of shrinkage and the gelatine has a distinctly yellow colour. Brain sections and eyes are the specimens most commonly seen mounted in gelatine.

The Paraffin-Glycerine method of mounting and preserving moist specimens as advocated by Dr. Cecil Rowntree in the Archives of the Middlesex Hospital, Vol. IX, May, 1907:—Natural colours are most excellently preserved by this method and it is very advantageous as regards photography, as the final fluid has the same refraction as glass and the specimen need not be removed from the fluid to be photographed. The method has also several disadvantages: 1st, the final fluid in which the specimen is kept, and which is Liquid Paraffin of the British Pharmacopeia, cannot be obtained perfectly clear; 2nd, the method is very expensive; 3rd, it is difficult to get the jars perfectly clear without boiling them after the liquid paraffin has once been put into them; 4th, a special method of sealing the jars is necessary. The following is a brief outline of the method:—

The fresh specimen when removed at the autopsy should not be washed, as much of the blood being kept in as possible. The specimen is placed immediately, or as soon as possible, into solution No. 1, consisting of

Sodium Sulphate	...gms. xx.
Sodium Chloride	...gms. x.
Magnesium Sulphate	...gms. xx.
Formalin	...c.c. L.
Water up to	...c.c. 1000

The specimen is left in this solution for 48 hours, or more, depending on its size and consistence. On removing from this the specimen is put through solution No. 2, which is 50 per cent. naphtha-free methylated spirits; this solution brings back the natural colour of the specimen, careful watching being necessary as long as the specimen is in this fluid, until all the colour is brought back. Now put the specimen into solution No. 3, which consists of

Sodium Acetate	...gms. xx.
Glycerine	...c.c. 500.
Water	...c.c. 500.

Leave in this solution 2-3 days. The specimen at first floats in this fluid and it has to be weighted down. These fluids may be used over and over again.

Specimen is now put into Solution No. IV, which is pure Glycerine, or may start with 50 per cent., and gradually work up to pure glycerine, leaving it in this for 3-4 days. The specimen is finally kept in Solution No. V, which is Liquid Paraffin (B.P.); this solution may have to be changed 2-3 times before the specimen can be set aside as finished, because the glycerine of Solution No. IV sinks to the bottom of No. V. and separates as a turbid layer of glycerine at the bottom of the jar.

Mounting Specimens:—Mounting dry specimens in museum jars:—Place a thin piece of wood on the under-surface of the jar-cover and fit it on tightly. Now firmly support the specimen from the piece of wood and arrange it at the bottom of the jar as required, seal the jar and paint the cover and the rim of the jar for about three-quarters of an inch down. The support for the specimen cannot be seen, and the arrangement looks very well and rather odd.

To mount very thin slices of tissues, flies, spiders, flukes, worms and other parasites without the background on which they are mounted being seen, the specimens appearing to float in the preserving fluid:—Take a thin sheet of fine mica and carefully, without scratching the edges, cut a piece to fit (not too tightly) the jar in which you want to mount the specimen. Now arrange the specimen on the mica and with a sharp needle make two to four holes behind it and sew on the specimen with fibres of fine silk, white or dark as may be required. Support the mica slab from the corners to the cover, imbedding the silk in the cement. In some of the specimens I have seen mounted in this way, it was almost impossible to tell even at close range how they were mounted. Some specimens look well on a white background, these may be mounted on white opal slabs. Small holes are drilled in the opal as required and the specimen is sewn on to it in the same way as to the mica.

To mount very fine and soft specimens that cannot be handled without destroying the natural outlines, e.g. jelly-fish, human ovum to show villi, etc., make a small mica box by folding up a cross-shaped piece of mica, ruling fine sharp lines where the folding is necessary and fine silk stay sutures to hold the walls together. The specimen is now dropped into the box, which is supported from the corners or the lid by china bead silk, which may be attached to the under-surface of the cover or held in place between the cover and the rim of the jar by embedding the silk in the sealing cement.

To suspend specimens:—Untwisted china bead silk is used for suspending light specimens and dentist's twist silk is used for the heavy specimens.

Petri dishes containing gelatine mounted specimens are covered with lids which extend beyond the edge of the Petri dish little more than an

eighth of an inch, and when these are sealed they are mounted in square black wood frames, being kept in position in these frames by brass catches; the contrast makes the specimen look very pretty, the jelly does not look so yellow as it is, and a shadow of the specimen may be thrown on to a screen and be of service for teaching purposes. If the lid is of ground glass or covered with white paper, the contrast is still greater and adds beauty to the specimen.

Methods of sealing Petri dishes and Museum jars:—Covers are sealed on the Petri dishes by either balsam alone or by a paste of moderate thickness composed of balsam and agar, the latter substance being supplied in quantities sufficient to make a good paste.

Jars are sealed with a paste made of a patent glue called Seccotine (any fish glue may be used, e.g. LePage's glue) and plaster of Paris, made moderately pasty; apply the paste to the rim of the jar, put on the cover and apply pressure. The cover and the cement are next painted with white enamel paint to make everything look uniform and to hide the deficiency of fluid in the jar, the fluid not coming in contact with the cover or cement. This is the cement most commonly used at the London Hospital Medical Museum. To remove the covers from these jars all that is necessary is to immerse the jar in water for twelve or fourteen hours.

The cement most commonly used at the Museum of the Royal College of Surgeons is composed of old gutta percha 5 parts, asphalt 4 parts, melt and mix thoroughly, do not burn as it will not stick. Heat the top of the jar, apply the hot cement, smooth the inside of the rim of the jar and apply a hot cover. The outer edge of the cement is usually varnished.

To seal museum jars where the Paraffin-glycerine method of preservation is used, liquid paraffin being the final fluid:—Take a thin sheet of celluloid, one to two mm. thick, cut a piece the size of the jar lid, moisten this sheet with a solution composed of equal parts of acetone, amylacetate and acetic acid, place in position, put the lid on and apply firm pressure for several hours. The label may be put in between the celluloid sheet and the cover. The specimen may also be suspended from this celluloid sheet.

Special Methods:—To show extension of a new growth in thin sections, the specimen being translucent and the tumour opaque, also a sharp definition between cartilage and bone adjoining each other:—Harden the specimen in formalin, dehydrate with alcohol or preferably acetone, clear in Xylol and mount in liquid paraffin. The specimen has to be watched in the various steps until the necessary points are brought

out. The definition between bone and adjoining cartilage is very sharp, while the lines of extension of tumour-growth show up as thin opaque radiations.

How to preserve gouty deposits in tissues while retaining as much as possible the natural colour of the specimen:—

1. Dehydrate the organ or tissue in absolute alcohol, several changes (about 3 or 4).
2. Put specimen into acetone and leave it for 3-4 weeks, depending, of course, on its thickness and consistence.
3. Put the specimen into Xylol and leave it for 6-8 weeks.
4. The specimen is ultimately kept in liquid paraffin.

The method is a long one but very efficacious, and the specimens prepared in this way are very beautiful.

To make cross sections of head bones, or other bones, skin remaining intact and no freezing necessary:—Drop the specimen into sulphurous acid and leave it in according to the size of the bones, from 15-25 days. (A dog's head, 15 days; test if bones are soft enough by sticking a pin into them from time to time.) The bones when softened may be cut with a knife and when carefully done the inside tissues (e.g. brain) are not in the least destroyed. I saw several specimens in the Museum of the Royal College of Surgeons prepared in this way, they were most interesting and very instructive, e.g. sections through the sinuses of the head, through the nose and through bony tumours, etc.

A method for corroding tissues, leaving nothing but a cast of vessels of an organ:—For this process a substance known as Fusible Metal is used. This metal has a low melting point and when cool is very hard; it comes in sticks like solder and is rather expensive, costing about $2.00 a pound, and is melted like lead. The substance when melted is injected into the vessels with a syringe, or allowed to drop in through a funnel from a height; when cool one may either put the injected organ into spirits and gradually pick away the redundant tissue till the injected vessels (one may inject bronchi) are reached, or one may put the specimen away in macerating fluid for some time and allow it to macerate slowly and not completely, observing from time to time how the process is progressing.

Injection of vessels:—Plaster of Paris is used widely as an injection for vessels, the superfine plaster being mostly used. To inject arteries colour the plaster with vermilion; to inject veins colour the plaster with Prussian blue; inject as much as possible in the direction of the blood current. Work with the plaster must be done quickly and everything must be ready before the plaster is mixed. This method of injection may be advantageously used in the corrosion method where the tissue is picked

away in spirits. In the Royal College of Surgeons I saw several specimens of lungs prepared by both the fusible metal and the coloured plaster of Paris methods; they make a very instructive picture.

Gelatine may be used as an injection material to show anatomical relations, the injection being done in a hot bath.

Most of the fine dissections in all the museums have black backgrounds.

General Observations:—The jars in all the museums are sealed, preventing specimens from being handled. Screw-top jars are not used, an undoubted disadvantage as regards teaching. Oval and round jars are the commonest used, while the square jar so commonly used on this side hardly has a place in any museum, excepting the Royal College of Surgeons. To see specimens mounted on glass frames is a luxury in the London museums, although very common at McGill.

Nearly all the museums have a common method of putting their catalogue numbers on jars, i.e. the jar is painted with two coats of white enamel paint, this is allowed to dry and on it are marked the required numbers in India ink, the label is now trimmed and finished by a coat of varnish over all.

None of the museums have as yet adopted the decimal system of classification of specimens. Classification is done numerically, the numbers going up in most museums to five numbers.

Book cataloguing of specimens is the commonest seen, although within the last few months the card system of cataloguing has been adopted by the Museum of the Royal College of Surgeons and that of St. Thomas Hospital Medical School. The advantages claimed for the method are that, (1) in large museums a specimen may be thrown away if desired, without disordering the book catalogue; (2) new specimens may be added without necessitating numerous appendices. At present there are twenty appendices to the general catalogue in the Royal College of Surgeons. The cards are arranged in duplicates, a complete set is kept outside and another set divided into lots is distributed in small boxes among the various departments of the museum. At the Royal College of Surgeons there is also a cross index for Diseases and Tissues.

RENAL CALCULUS.—CASE REPORT.

BY

J. M. ELDER, M.D.

Surgeon to the Montreal General Hospital.

E. L...., aged 22, of New Brunswick. Sent up to us by Dr. Macnaughton, of Moncton, N.B., with probable diagnosis of renal calculus or tuberculosis of right kidney.

Complaint:—Pain in right side.

Present Illness:—Ever since childhood, patient has been more or less troubled with attacks of abdominal pain at varying intervals.

About seven years ago pain began to be more in right side of abdomen —this pain varied in character —at times a dull ache in right lumbar region, and at other times a sharp shooting pain, radiating from region of right kidney down into right groin and testicle.

Nearly always vomits when he has these attacks of colicky pain—pain is so severe as to cause him to writhe.

Had no urinary disturbance accompanying these sharp attacks.

Has had, on an average, about two of these attacks each month for the past seven years.

Between these attacks of colic, he would have a persistent dull aching pain in right lumbar region, present almost constantly, more in the morning and disappearing somewhat towards night. Pain was not aggravated by motion.

Seven years ago, was operated on in Massachusetts General Hospital, and had appendix and Meckel's diverticulum removed. (Neither of these organs appeared to be diseased.) Pain was no better after this.

About two months ago, for one day only, had frequency of micturition—about every 15 minutes—and pain and burning on micturition. Apart from this, has never had any frequency of micturition or pain. Has never noticed blood in the urine.

Operation:—September 23, 1909. Nephro-lithotomy.

Clinical diagnosis:—Renal calculus.

Anæsthetic:—Ether.

Renal preparation and position.

Oblique incision about 4″ long made over right kidney below last rib. Muscles separated and kidney capsule exposed.

Numerous adhesions found and some difficulty experienced in delivering kidney.

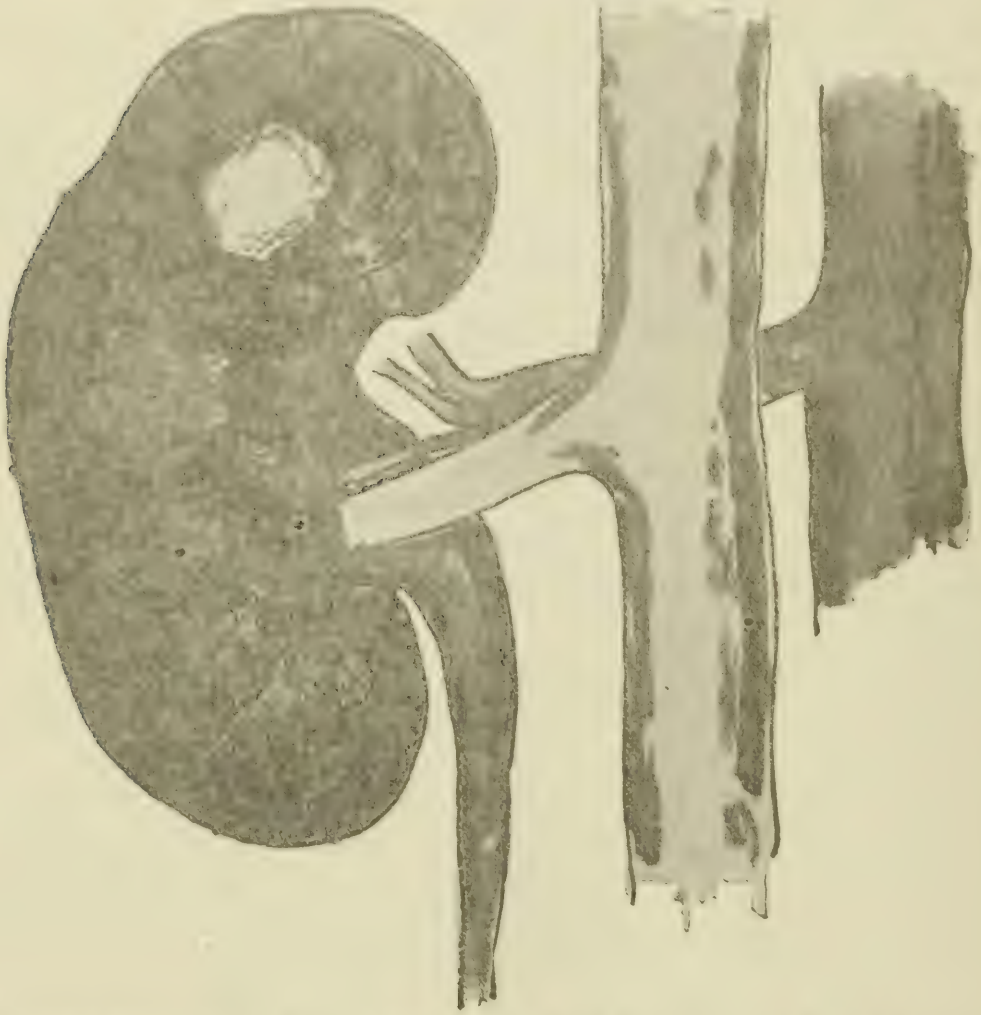
Reported at the Medico-Chirurgical Society of Montreal.

Kidney delivered with special forceps, resembling small obstetric forceps.

Calculus readily felt at upper pole.

Pedicle held tightly by assistant's hands, and small incision made in kidney at upper pole. Calculus found and removed with a calculus scoop, such as commonly used for gall-bladder work.

Stone found to be about the size of a pigeon's egg—with rough exterior, apparently an oxalate stone.



Drawing made for Dr. Elder's case of stone in right kidney, by Dr. McCordick, of the Montreal General Hospital house staff.

Mattress suture of heavy cat-gut passed to control hæmorrhage in kidney cortex—capsule closed with interrupted sutures of finer cat-gut and kidney returned within wound.

Muscles brought together with finer cat-gut suture.

Skin closed with s.w. gut suture, leaving small cigarette drain down to kidney for 24 hours.

No vessels required ligation in whole operation.

Patient made uninterrupted recovery.

Has never had any night sweats. Has not lost noticeably in weight. Has no cough or expectoration.

Present condition:—Patient is a well-developed, well-nourished man. Skin moist. Mucous membrane, good color.

Respiration and circulatory systems:—Normal.

Abdomen:—Symmetrical, moves with respiration.

Has long scar in mid-line below umbilicus from old operation.

Walls soft on palpation—no tenderness or rigidity—no organs palpably enlarged.

Abdomen tympanitic throughout on percussion.

Behind, in lumbar region there is marked tenderness in region of right kidney and rather more resistance in right costo-vertebral angle than in left, but there is no special fulness about right kidney to be felt.

September 20, 1909.

Patient examined by cystoscope and catheterization of ureters by Dr. R. P. Campbell. Bladder found to be normal.

Catheter left in right ureter and X-ray taken.

X-ray showed quite distinctly a small stone, apparently about the size of a pigeon's egg in upper half of right kidney.

The shadow was so definite that Dr. Wilkins, the radiographer, was of opinion that the calculus was composed of oxalate of lime salts.

Date	Sp. Gr.	React.	Colour Sedim't	Urea	Alb.	Sugar	Microscopic Xtls. Blood. Pus. Epithelium. Casts. Bacteria.
Sept. 20, 1909							
Common .	1025	ac	slight	–	tr	–	Pus cells in moderate Nos.
Rt.	1018	ac	slight	1.8	tr	0	Few pus cells and rbc.
Left	1030	ac	slight	2.5	tr	½%	Rbc traumatic—some shadow cells.

Bougie introduced in right as high as pelvis of kidney and sent to X-ray. Culture for common urine—no growth.

Diagnosis: Inhibited functions right kidney without infection and with pyelitis—most probably stone.

(Sgd.) R. P. CAMPBELL.

COMPLICATING MICRO-ORGANISMS AND THEIR RELATION TO HÆMOPTYSIS IN PULMONARY TUBERCULOSIS.

BY

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Discussions and publications regarding hæmoptysis have usually assumed the extension of the tubercle in a vessel wall plus the blood pressure to be the causative factors of the hemorrhage. Jansen,(1) Minns and others have statically shown probable relationship between the atmospheric conditions and the occurrence of hemorrhage. Flick (2) has called attention to the increase of diplococci and streptococci in hemorrhage sputum.

As a result of these conceptions, the administration of drugs designed to permanently reduce the intrapulmonary blood pressure and increase the coagulability (together with such aids as morphine and chloroform (3) at the critical moments) have constituted the usual routine treatment.

The purpose of this paper is to present some observations and incomplete investigations that led us to the conclusion that hæmoptysis in Pulmonary Tuberculosis frequently results from the lesion caused by certain complicating micro-organisms rather than the tubercle bacillus itself. The solid tissue make up of a pure tubercular lesion in contrast to the condition obtained in other infections seems at the outset to favor this possibility.(4)

Blood pressure must always be a general factor, but as it is usually low in tuberculosis, it probably is not of direct significance. The therapeutic results by attempting to lower the pressure do not seem to suggest it is more.

In the cases where the hæmoptysis is a very early or initial symptom it has usually pathologico-anatomically been explained as due to a tubercle located in the vessel wall.(5) The further explanation is that with such a situation, local blood pressure changes may be produced and the chances of a hemorrhage facilitated. If such is usually the case, one might expect this symptom to be more frequent during miliary extension. (6) In involvement of the wall of the middle cerebral artery hemorrhage at the base of the brain might be expected. Neither of these results are obtained.

Practically we believe that in the hemorrhage lesion a complicating micro-organism could usually be demonstrated; and that this organism

Read before the Canadian Medical Association at Winnipeg, August, 1909.

has more to do with the solution of tissue necessary for the production of hemorrhage than the tubercle bacillus. Either the solution of tissue itself opens the vessel wall or causes first a small aneurysm by weakening the wall and its tissue support.

If such is the case the administration of suitable vaccines is the rational therapeutic procedure. This conception also admits of the likelihood of a complicating organism very early in the disease—while the lesion is still small. The time for vaccine therapy must then be advanced before the occurrence of the so-called open condition. The mode of infection would probably be by the blood stream, which is not at variance with accepted conceptions.

This field of effect is then a special activity on the part of certain complicating micro-organisms, although we recognize that men working in tuberculosis do not agree upon the part played by the so-called secondary or mixed infections even in open cases.

Thirteen cases have been investigated—some more, some less. The procedure has chiefly been the washing of suitable particles of hemorrhagic sputum. (One positive blood culture was obtained.) Before collecting the sputum the patient washes his mouth with carbolic saline. An attempt is made to get coughed up hemorrhagic particles. Immediate smears are made from the washed sputum and preserved for controls.

A large capillary pipette was found to be the most efficient method of thoroughly washing the particles. This readily allows smears to be made at different washings.

When a small particle has been sufficiently washed it is rubbed over serum agar and blood serum surfaces. (Particles showing intimate relation with the blood cells, and the presence of phagocyted organisms by cells evidently not from the mouth should be chosen).

As is shown in the following list two organisms (rarely three) have been recovered. Repeats often confirmed exactly the original results:

1. E.P. Gram pos. diplococci.
2. W.J.S Gram pos. diplococci, Gram neg. diplococcus (Catarrhalis?).
3. G.T. bacillus Friedlander, Gram neg. diplococcus (Catarrhalis?).
4. R.E.L. Gram pos. diplo., B. Colon, also streptococcus.
5. R.T.V. Gram pos. diplo., Gram neg. diplococcus (dry adherent and color).
6. J.R. Gram pos. diplo. (Also obtained by blood culture).
7. H.K. Gram pos. diplo., gram neg. diplo. (dry adherent color), also streptococcus.
8. E.H. Gram pos. diplo., Gram neg. diplo. (dry adherent color).

9. H.P.W. Gram pos. diplo., Gram neg. diplo. (moist).
10. C.W.A. Gram pos. diplo., Gram neg. diplo. (moist).
11. P.O.F. Gram pos. diplo., Gram neg. diplo. (dry adherent).
12. A.H.W. Gram pos. diplo., Gram neg. diplo. (moist).
13. A.B. Gram pos. diplo., gram neg. diplo. (Catarrhalis).

It will be seen from the list that out of the thirteen cases investigated twelve gave Gram positive and ten gave Gram negative diplococci. A brief and incomplete description of some of the characteristics we have worked out is as follows:—

Gram Positive Variety:—Sufficient investigation has not been done in this organism to satisfy us that any of the organisms found in the different cases are identical. Microscopically many of them appear to be so.

Morphology:—Diplococci occurring in paired hemispheres, separated by a well marked unstained interval and showing considerable variation in size cultures. Frequently the organisms show a tendency to occur in chains of from four to six elements. Single cocci are seldom found. The organism when stained by Gram's method retains its stain, though occasionally evidence of loss of stain can be seen (as noted in Chart).

Blood serum: Cultures after twenty-four hours' incubation appear as fine, round, whitish, shining, slightly raised colonies, which on further incubation may become confluent.

Serum gelatine agar: more copious growths, colonies more confluent and semitranslucent.

Frequent subculturing is necessary to maintain viability. A number of these cocci have seemed to show marked variation during their cultivation toward the Gram stain.

Gram Negative Variety:—Out of thirteen cases investigated ten gave Gram negative cocci. Of these three were distinctly of the micrococcus catarrhalis type; four of a more easily grown moist type and four of a dryer crinkled type. A short description of the last two is as follows:—

Moist Type: Morphology.—A diplococcus of medium size showing a tendency of grouping in fours or tetrads completely decolorized by Gram's method. Grows rapidly on all media, presenting on serum gelatine agar a confluent whitish or greyish, moist semitranslucent heaped up growth which collapses with peripheral extension. Blood serum shows marked tendency to digestion of the media.

The second type of Gram negative diplococcus is one which grows only on blood serum and serum agar, and owing to its intimate association with the Gram positive diplococcus is with difficulty obtained in pure culture.

Morphology.—Diplococci small in size, appearing in pairs and masses and occasionally singly.

Serum Agar: Colonies present two types of growth. One large (1-3 mm.) round or oval sharply defined, heaped up colonies surrounded by small fine round discrete colonies. Both are very viscid and eat into the media. Only with difficulty can the colonies be removed or broken up.

Blood serum: Here the growth appears as small round heaped up colonies. Sub-cultures may or may not show a slight greenish metachromosis.

Viability is quickly lost, being most easily maintained by frequent subculturing on alternate media.

In cultures incubated for more than twenty-four hours there is a moderate degree of irregularity in the size and staining quality of the organism. Degeneration of the elements becomes well marked with age.

The two types of Gram negative cocci in contrast to the typical micrococcus catarrhalis seem on the one hand to have increased ability for moist growth with media digestion, and on the other a tendency to a dry and crinkled colony formation with occasional chromogenesis.

The various sugar reactions for these organisms are now being worked out and will be reported at a later date.

As to the pathogenicity, three of the organisms have been shown to be both pathogenic and toxic to rabbits and guinea-pigs although recovery has been the rule.

Investigation to show relationship between organisms recovered and the patient: Out of six cases inoculated with their recovered organisms four showed hypersensitiveness by giving a local reaction. The dose used has been small,—from 5-15 M. for the first inoculation.

Agglutination estimations and the reaction of fixation have not yet been sufficiently applied to give us either positive or negative results.

The opsonic index and especially the index obtained from diluted serum and activated serums has given us the most conclusive results.

Thus case K. gave three organisms:—

(1) Gram pos. diplococcus.

(2) Gram neg. diplococcus.

(3) Gram pos. streptococcus.

H.K. serum diluted in contrast to normal serum gave the following results: In this particular experiment the results for the Gram negative coccus could not be estimated.

	Gram Positive Diplococcus.				Streptococcus.			
	Phagocytic Indices.		Phagocyting Polynuclears.		Phagocytic Indices.		Phagocyting Polynuclears.	
Dilutions	K.	N.	K.	N.	K.	N.	K.	N.
1–2	5.60	5.38			3.32	3.84	–	–
1–4	6.16	3.96	74	44	1.28	1.50	28	31
1–8	3.82	.97	47	18	.13	.30	7	10
1–16	1.85	1.21	34	22	–	–	–	–
1–32	1.50	.74	–	10	.30	.31	5	9
1–64	1.44	.37	30	11	.23	.13	6	6
Salt	.23.....		8			17.....	7	

One post-mortem was obtained on a case which had shown considerable hemorrhage (J.R.) for some days before death. The left lung showed a reddish grey hepatization of the lower half of the upper lobe and the greater part of the lower lobe. Smears taken at different parts of this showed only the bacilli tuberculosis. The remaining part of the upper lobe showed two small cavities towards the apex and irregularly (bronchially?) arranged tuberculous masses. One area (the centre of which was possibly a small cavity) was blood stained and contained small clots. Immediate smears showed besides the bacillus tuberculosis both Gram positive and negative cocci. Both cocci were not confined, however, to this stained area in the upper part of this lobe.

Because of the irregular course that hemorrhage cases pursue, the fact that vaccine treated cases have had but slight reoccurrence while at the Institute and under treatment, cannot be taken for clinical evidence of efficiency. Amongst this number, however, there have been three which now present histories of more certain clinical value than the others:—

1. G.T., male, age 23; Cl. ii, moderately advanced; duration, two and a half years; gave a history of frequent hemorrhages and coloring. He was in the Institute for three months before he was taken on the laboratory clinic. During this time he had almost daily coloring and frequent small hemorrhages. On the 4th May he was inoculated with his own vaccine. On the 6th the coloring began to lessen; on the 8th it had disappeared. The last inoculation was on the 15th June. During this time coloring occurred twice for short durations. He left, making arrangements to take vaccine with his own physician to whom we supplied the organisms. This is the only case where other than a Gram positive and Gram negative coccus was used. In this instance the patient received Friedlander's bacillus as well. This case was running slight temperature which disappeared with the loss of color.

2. W.G.S., male, age 48; Cl ii, moderately advanced; history of persistent coloring and hemorrhages. On the 21st May patient received 14 M. of his vaccine made from two organisms secured from his sputum,—a Gram positive and Gram negative diplococcus. He received four inoculations, leaving the Institution on the 11th June. During this time

the color was markedly lessened though he had one small hemorrhage. Vaccine was supplied to his physician and he wrote to say the color gradually ceased.

3. E.P., female, age 47; Incipient, Class i; suspicious apical signs only. Positive von Pirquet, positive subcutaneous reaction with .5 mg. O.T. negative Wolff-Eisner Calmette opthelmic reaction. Symptoms chiefly frequent expectoration and hemorrhages which had persisted over a year. Eventually clinical signs pointed to a small bronchiectasis. A Gram positive diplococcus was recovered and the vaccine given. Under this treatment marked improvement took place with cessation of hemorrhages and colouring. This case is peculiar because on consideration of the laboratory investigations and the clinical findings at first and subsequently, it would be impossible to state that the tubercle bacillus was present in the active lesion or itself at the time active.

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2. Allbutt's System, Bol. 5, p. 379.
3. Fish. J.A.M.A., June 12, 1909.
5. Bonney, p. 97.
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An urgent appeal is now being made to the English-speaking community of Montreal to subscribe the necessary funds to enable the Alexandra Hospital for Contagious Diseases to liquidate its debt to its bankers, which amounts approximately to $100,000. If this debt were obliterated it is confidently believed the hospital would, with its annual subscriptions and payments by the city, be self-sustaining. A number of friends, who have already been generous subscribers, are again coming to the rescue. The Alexandra Hospital is doing most important work, and it is unfortunate that the executive should be hampered, as they are now, by lack of funds. Subscriptions should be sent to Mr. James Crathern, treasurer, Room, 112, Bell Telephone Building, Montreal.

THE

Montreal Medical Journal.

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EDITED BY

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THE TEACHING OF PATHOLOGY.

This is an admirable work. It is not written for the advanced student: it names few authorities and gives fewer references, even to the more recent literature: it does not enter into the pros and cons of matters of present debate: it either steers clear of such or by means of a note of interrogation indicates that the view which is mentioned, while favoured by the writer, is debatable. The object of the editor and his collaborators has been to afford in terse yet eminently readable language, an authoritative conspectus of the present state of pathological anatomy.

Inevitably we are led to compare this product of the Professor of Pathology at Freiburg with that of his predecessor, the well-known Ziegler. As the production of a single worker that was a masterpiece. No one in our day and generation had so wide and intimate a knowledge of the many departments of General and Special Pathology, and with the judicious selection of matter and admirable bibliographies at the end of each section, the volumes of Ziegler were indispensable to the worker. By the sheer force of these virtues it became the acknowledged text-book of Europe and indeed of America. We must, however, admit that for the ordinary student it was painful reading, only a few degrees removed in its literary style from that possessed by a dictionary. As with succes-

Pathologische Anatomie. Ein Lehrbuch fur Studirende und Arzte. Vol. I. Allegemeine Atiologie. Allegemeine Pathologische Anatomie, with 364 illustrations mostly colored. Vol. II. Spezielle Pathologische Anatomie, with 552 illustrations mostly colored, and 1 lithographic plate. Edited by L. Aschoff, Professor of Pathology in the University of Freiburg, with the co-operation of numerous workers. Jena: Gustav Fischer, 1909.

sive editions new matter was added to keep it up to date and recognize each advance in our knowledge, the condensation became extreme. In this work there is no attempt to emulate Ziegler along these lines. Each section has been placed in the hands of one recognized as an authority upon that particular branch of pathology, and evidently he has been asked not to detail all that is known, but to put forward simply and clearly what is the present status of assured knowledge in that branch. The fact that he is an acknowledged authority renders it unnecessary for him to quote chapter and verse in support of his statements. As a result turgidity is noticeably absent: the work is what a text-book for the ordinary student ought to be.

As all know who have consulted systems of medicine or surgery there are defects to which all works constructed upon the co-operative principle are inherently liable, defects that only editorship of the first order can overcome: namely, uneven treatment of the different sections, irregularities in style, and contradictory teaching. Here the editorship has clearly been of that first order. The evenness of the workmanship is remarkable: it is rare to encounter a section that is not magisterial. Still more striking is the absence of extreme personal views and of contradictory teaching.

There is only one criticism of a broad nature which we would venture to make, a criticism which, when the volumes are so frankly labelled General Pathological Anatomy and Special Pathological Anatomy, may seem uncalled for. It is this, that works of such excellent quality tend to divorce still further the study of anatomical and of functional pathology. The publisher in his announcement of the work lays stress upon this divorce as inevitable. So huge is the accumulation of material in these two main divisions of the subject that it is impossible to treat both within the limits of a single text-book. He regards it as necessary that the pathologist of the future must be an anatomist pure and simple, and that functional pathology or "pathological physiology" must be taught by clinicians or become the subject of a special chair, suggesting that pharmacology with its more modern developments seems predestined to take this for its own. Judged from the work pouring out from the various pathological laboratories in Germany the divorce is already accomplished. We cannot but hold that this is in the highest degree harmful to the student to whom as a future practitioner pathological anatomy uncorrelated with the study of disturbed function is largely valueless, and to the professor, who, becoming a pure anatomist, voluntarily estranges himself from the great problems of modern medicine and their elucidation. For this is certain that those problems are to be solved by

any one but the anatomist. He at most can be an auxiliary after the event. It is by the pathological chemist and the pathological physiologist that these problems are to be solved, and if pathological anatomy is to be regarded as the subject to which the official teaching of pathology in our universities is to be restricted, then will pathology become as much a closed science as is anatomy in too many of our medical schools.

We are led to make this somewhat long criticism because there are but two leaders of German pathology of to-day who to us, outside, stand as examples of what the pathologist ought to be, men whose writings show them to be deeply versed in both divisions of pathology, who investigate and write with equal authority upon the anatomical, bacteriological, embryological and physiological aspects of our science, and one of these two is Professor Aschoff. As a matter of fact, it has to be pointed out that he has found it impossible to keep within the narrower limits. There are long and interesting chapters in the first volume upon what are strictly physiological pathology: such, for example, is the late Professor E. Albrecht's article upon internal causes of disease and heredity, Professor Askanazy's admirable chapters upon the exogenous causes of disease, while both Gierke in the discussion of fever, and Kretz in that upon immunity have to admit that to treat these from an anatomical point of view is to make bricks without straw, and they supply the straw accordingly.

We cannot leave these volumes without a word of hearty commendation for the good printing and the exquisite coloured illustrations. The latter are far ahead of anything known to us thus far in a pathological text-book.

THE TEACHING OF PHYSIOLOGY.

Reviewing the instruction in physiology given to medical students in England and the States,—and medical students form ninety-nine per cent. of those coming under professors of physiology—not a few of us have felt that the teaching in this subject has during this generation become increasingly estranged from the needs of the would-be practitioner. The physiologists have tended to become specialists, each cultivating a narrow field, and teaching has suffered in consequence. It may be that the muscle-nerve preparation affords the simplest means of introducing to that student the methods of exact measurement of vital phenomena. But after all muscle is the tissue which least troubles the

A Text-Book of Experimental Physiology for Students of Medicine. By N. H. Alcock, M.D., D.Sc., and F. O'B. Ellison, M.D., St. Mary's Hospital Medical School, London. With a preface by E. H. Starling, M.D., F.R.C.P., F.R.S., London. J. and A. Churchill, 1909.

physician by its morbid states,—and nervous disorders are so complex that their study almost inevitably has become the life work of the neurologist. There are other systems which lend themselves to study, and while it is right that the student should have a general knowledge of muscular and nervous phenomena, it is vastly more important for him to be familiar by direct study with the main facts regarding the circulatory, the respiratory, digestive and urinary systems, and the ductless glands. Wherefore, we have been indignant when reading the syllabuses of certain schools to discover that half or even more of the practical work has been given over to muscle-nerve experiments. Evidently these objections have gathered strength and, as we learn from Professor Starling's preface to the work under review, the University of London in the process of clearing its house and adapting itself to new conditions has determined to put an end to this state of affairs, and has, we think most wisely, put out a syllabus indicating the ground to be covered by the students who present themselves for examination. And as these students hail from the many medical schools of London and indeed of England, this action on their part means a most important reform in the teaching of Physiology in England generally. This book by Dr. Alcock, Physiologist at St. Mary's Hospital, and his Associate, Dr. Ellison, is intended to cover the practical work demanded by the new syllabus, and as such well deserves study.

The treatment is brief without sacrifice of clearness: the instructions for the performance of thirty-seven lessons (or periods of two hours' practical work) are given in 135 pages. After a few pages upon the dissection of the freshly killed rabbit for physiological purposes, nineteen pages are given to four lessons upon muscle-nerve work; twenty-six pages (four lessons) to the heart and circulation; ten pages to the digestive system, saliva and pancreatic juice, movements of the alimentary viscera; thirteen pages (four lessons) to respiration; two lessons to the blood; two to urine and urinary secretion; one to temperature; four lessons (10 pages) to the nervous system, including tendon phenomena and reaction time; and six lessons to the special senses, including studies upon the ophthalmoscope, ophthalmometer, and the perimeter.

Dr. Alcock has already made a reputation for himself as first editor of that most admirable quarterly "Science Progress." The same breadth of knowledge and of interest shown in that journal manifests itself here in his treatment of his particular "Fach."

The appointment of Dr. Daniel J. Healy to the Medical Superintendency of the Institute for the Feeble-Minded at Frankfort, Kentucky,

is mentioned editorially in the "*Lexington Herald*" in terms of the highest commendation. Dr. Healy is described as a Canadian who came to Kentucky, and who has, without local ties or family influence, attained to this post by virtue solely of his high professional reputation and his known probity of character. Dr. Healy graduated in Medicine in 1896. He held the post of Anatomist at the Army Medical Museum from 1904 to 1907, and it was during his term of office there that the large donations of specimens to the McGill Medical Museum, lately wrecked by fire, were made. While Dr. Healy's post as Anatomist in the Army Medical Museum was a subordinate one and he was therefore not directly responsible for the generous donations made, we have reason to know that he did his part in attracting the attention of those in authority to the needs of the McGill Museum at that critical time. This announcement of his success in the specialty of his choice is therefore particularly gratifying to the Alma Mater of which he has shown himself so loyal a son.

A graduate of McGill University, 1907, who has had a Hospital experience and is willing to replace a doctor or act as assistant to such from November 1st, 1909, to July 15th, 1910, can be communicated with by addressing this JOURNAL, P. O. Box 273, Montreal.

Wanted to purchase by M.D. (Edin.), M.R.C.S. (Eng.), share in a practice in Province of Quebec, Montreal or suburbs preferred. Personal interview at Montreal after 7th November. For further particulars write "Navy," care of MONTREAL MEDICAL JOURNAL.

February 1st, 1910, has been set as the time limit for submitting papers for the annual meeting of the Canadian Medical Association to be held in Toronto on June 1st. Abstracts of all papers are to be in the hands of the General Secretary by April 1st, so as to provide for printing and posting.

The President of the American Gynæcological Society has appointed a Committee to report at the next annual meeting in Washington, on the present status of obstetrical teaching in Europe and America, and to recommend improvements in the scope and character of the teaching of obstetrics in America. The Committee consists of the Professors of Obstetrics in Columbia University, University of Pennsylvania, Harvard, Jefferson Medical College, Johns Hopkins University, Cornell University, and the University of Chicago. Communications from any one interested in the subject will be gladly received by the Chairman of the Committee, Dr. B. C. Hirst, 1821 Spruce St., Philadelphia.

On the invitation of the Department of State of the United States Government, the XVth International Congress on Hygiene and Demography will convene for the first time on the American continent in Washington, D.C., from September 26th to October 1st, 1910. Section III of this Congress deals with the subjects of the Hygiene of Infancy and Childhood: School Hygiene. It is believed that this will be a meeting of the utmost importance.

Reviews and Notices of Books.

Medical Diet Charts. Prepared by H. D. Arnold, M.D., Professor of Clinical Medicine at Tufts Medical College, Boston. Philadelphia and London: W. B. Saunders Company, 1909. Single Charts, five cents; 50 Charts, $2.00; 500 Charts, $18.00; 1,000 Charts, $30.00. Canadian Agents: The J. F. Hartz Co., Ltd., Toronto.

These diet charts are excellent, and the general practitioner will find them essential in regulating scientifically the diet of his patients. They give on one sheet all the data necessary for arranging and calculating the nutritive value of a diet and furnish a convenient means of recording the results. Chart A has space for recording the diet for five successive days or for five changes of diet for any interval of time. Chart B fulfils the same functions for a single day. There is one feature that makes these charts extremely practical, namely, the information they give as to the nutritive value of food in measures such as are used in everyday life.

The Medical Record Visiting List. William Wood and Company, New York. For 60 patients a week, with or without dates, handsomely selected red or black morocco binding, $1.50; for 30 patients a week, with or without dates, same style, $1.25.

This is the seventh occasion on which the present reviewer has commented upon this book, and for as many years it has been a daily companion. Nothing more complete and convenient could be imagined for recording the results of one's daily rounds.

The Blood in Health and Disease. By R. J. M. Buchanan, M.D., F.R.C.P., University of Liverpool. Oxford Medical Publications, 318 pages, illustrated. Canadian Representatives: D. T. McAinsh & Co., Toronto.

This book makes its way into an already crowded field, but it has a good chance of making its place if a general all-round excellence will suffice. It is written for the use of students and practitioners, and, this

being so, it confines itself strictly to the part of the subject that concerns these classes. There is a minimum of theory, and there is no excursion into the field of those much-vexed questions of hæmatology with which so much literature has lately concerned itself. Dr. Buchanan contents himself with a brief statement of the derivation of leucocytes which favors a combination of the views of Ehrlich and Uskoff: the debatable leucoblast he considers as a precursor of the myelocyte, and that "mixed" leukæmias have no double origin but that the various cells mark progression of the disease. However, of subject for controversy there is little in the book, and its usefulness is enhanced thereby.

Everything necessary for the ordinary clinical examination of the blood is here, briefly described and well illustrated. Following the description of the armamentarium is a detail of the morphology of all the blood cells, after which comes a consideration of anæmias, leukæmias and the effect of various diseases upon the blood.

The colored illustrations are made by the author, are good and are well reproduced. The book is printed and bound in good style, and we commend it.

Drugs and the Drug Habit. By Harrington Sainsbury, M.D., F.R.C.P., Fellow of the Physiological Society, Senior Physician to the Royal Free Hospital, Consulting Physician to the City of London Hospital for Diseases of the Chest. With eleven illustrations. Methuen & Co., 36 Essex Street, Strand, W.C., London, 1909. Price, 7s. 6d. net.

Dr. Sainsbury has written a book that is far from conventional; the author will scarcely feel hurt if the reviewer says that for the first fifty pages he wonders just what kind of a book it is. However, he soon discovers that he is dealing with an abstract statement of the subjects of therapeusis and drug habits by one who has brought the book out of his head, who has included in it scarcely a single statement which requires a bibliographical reference. The wealth of classical allusion, particularly in the part historical, may be thought to demand of the author an occasional peep into a classical dictionary of history, but the author's Latinity suggests that this is scarcely necessary. When Latin phrases are employed, it is comfortable to find them correct.

It might be thought, from the foregoing, that Dr. Sainsbury's good style and classical allusions mark his book as literary rather than scientific, but it is not so: the physiology is that of to-day, and no reviewer will find anything to object to in the numerous pages that deal with the most modern of research. Far be it from us to say that modernity im-

plies truthfulness, but if one teaches, it is right that he should know the last word.

The author points out the parallel that exists fundamentally between serum therapy, as an example of modern therapeutics, and the use of drugs, as typifying the old methods. While he has a strong regard for "drugs," to use his own term, it is refreshing to find that his illustrations never mention drugs that are not universally admitted to be effective: of the "lumber" of the materia medica there is no word.

The physiology of habit, especially drug-habit, is set forth in a clear way, and may be understood by any intelligent layman; the explanation offered, while probably not the real one, serves, and the author claims nothing more for it. In the matter of the cure of drug habits, the responsibility is laid where it belongs: the restoration of the patient's impaired will-power the essential thing, and without it nothing can be permanently accomplished. There are some pregnant pages upon the "drink problem."

Dr. Sainsbury's book is in no sense a specific guide for the practitioner who is interested in the treatment of drug habits, nor is it intended to be: any one who reads it will be the better able to appreciate the meaning of the disease, its nature and therefore its treatment. We have found much pleasure in reading it.

J. McC.

"Modern Problems in Psychiatry." By Ernesto Lugaro, Professor Extraordinary of Neuropathology and Psychiatry in the University of Modena. Translated by David Orr, M.D., Assistant Medical Officer and Pathologist in the Lancashire County Asylum, Prestwich, and R. G. Rows, M.D., Assistant Medical Officer and Pathologist in the Lancashire County Asylum, Lancaster, with a foreword by T. S. Clouston, M.D., LL.D. 320 pages. Demy 8-vo. 8 Plates. Price, 7s. 6d. net, postage 6d. Sherratt & Hughes, Publishers to the Victoria University of Manchester. Manchester, 34 Cross St.; London, 33 Soho Sq. W.

After a careful reading of this book, we can heartily echo Dr. T. S. Clouston's opinion expressed in the "foreword" to the translator's work. "Lugaro is one of the master spirits of biological science who, while knowing and using the details and facts of his subject, is not content with a narrow and technical view of it, but presses into its elucidation all the correlated sciences of anatomy, physiology, biology, and psychology," and shows their exact bearing on the subject of the mental disturbances and defects of the human brain.

With a keen insight into his subject he points out the lines future research should take. He is always practical, combining caution with scientific enthusiasm.

It is impossible in the short space of this review to discuss the various chapters individually. But we can sincerely recommend this book not only to every psychiatrist but to every student of the science of medicine.

C. K. R.

A Text-Book of Obstetrics. By Barton Cooke Hirst, M.D. Sixth Edition Revised and Enlarged. Philadelphia and London: W. B. Saunders Co., 1909. Canadian agents: The J. F. Hartz Co., Ltd., Toronto.

This well-known and popular text-book has undergone thorough revision, and a good deal of new matter has been added. The feature of the new edition is that the author describes and illustrates many operations which are generally regarded as belonging to the domain of gynæcology. He maintains, quite rightly I think, that the general practitioner as well as the obstetric specialist should be prepared to operate for retroversion of the uterus following delivery, and for ectopic gestation, that he should be able to do a Porro or a supravaginal hysterectomy, and that he should be familiar with the best methods of doing a plastic repair when the genital tract has been injured during labor. A number of very good cuts illustrate the technique of these operations, and should prove helpful to those who do not have access to the service of a good hospital clinic.

The tone of the book is judicial, and on the whole conservative, a matter for which, at the present day, we should feel devoutly thankful. Dr. Hirst's book can be recommended to practitioner as well as to student, as being up to date, thorough, and practical.

A System of Ophthalmic Therapeutics. By Casey A. Wood, M.D., C.M., D.C.L. The Cleveland Press, Chicago, 1909.

This system of ophthalmic therapeutics of which Dr. Casey A. Wood is the editor and chief contributor is the first work of any significance which has appeared in English, and may truly be said to be the last word that has been written on this comprehensive and most interesting subject in any language. The tremendous experience and guiding influence of the editor is recognized throughout all the departments of the work, and the various sections have been treated in a most conscientious manner.

Some of the more recent methods at present in vogue in ophthalmic therapeutics, as the use of tuberculin, the employment of subconjunctival

injections and phototherapy, and to which a reference to rather exhaustive monographs has been necessary, are welcomed as much on account of their reasonable brevity as well as on account of the intelligent manner in which the subject matter is laid before the reader. Dr. Wood's close observation of detail is particularly valuable and interesting in the section devoted to local anæsthetics, the action of the various mydriatics, as well as that in which he deals with silver and its salts.

The system is distinctly original in one respect in that in addition to the author's deep store of knowledge of the subject, besides the valuable information which has been gathered from a most careful reference to the literature, particular forms of treatment, prescriptions, and appliances have been added which the editor has been supplied with by a large number of his professional friends, a great many of these treatises not having as yet found their way into medical works.

The history of ophthalmic therapeutics from the earliest times is dealt with by Dr. Alfred Murray. Electricity in ophthalmic practice and electro-therapy in diseases of the ocular apparatus receive a most intelligent treatment by Dr. W. Franklin Coleman. The importance of bacterial therapy and serum and bacterial reactions in diagnosis is emphasized by Dr. Ernest E. Irons. Dr. Frank Allport has written a chapter on the important subject of the systematic examination of school children, while Dr. N. M. Black has contributed one on the examination of corporation employees.

Dr. Alfred C. Croftan has written three chapters of particular value and interest on the treatment of certain systemic diseases that involve the ocular apparatus, as diabetes, rheumatism, gout, pernicious anæmia, chlorosis, leukæmia, scurvy, hæmophilia, purpura, Schœnlein's disease, Bright's disease, arterio-sclerosis, valvular disease of the heart, malaria, diphtheria, and acute articular rheumatism. The treatment of the more important nervous diseases that affect the eye has been carefully dwelt upon by Dr. D'Orsay Hecht. Dr. Frank Brawley supplies an interesting as well as an original chapter on the non-surgical treatment of those diseases of the nose and its neighbouring cavities that affect the ocular apparatus, while Dr. H. H. Peterson has carefully considered the question of general anæsthesia in ophthalmic operations.

Two points of by no means the least importance and interest are the complete bibliography, and a very carefully prepared index of the work. The system consists of upwards of nine hundred pages and the way in which the book has been presented to the public is a distinct credit to the publishers. All who have seen this work and who are particularly interested in the treatment of ocular disorders must be only too willing to

agree that a most valuable contribution has been added to ophthalmic literature and that Dr. Wood deserves the united congratulations and thanks of English speaking ophthalmologists for having brought to such a successful issue the task which he has undertaken.

F. T. T.

LECTURES ON THE PATHOLOGY OF CANCER. By CHARLES POWELL WHITE, M.A., M.D., F.R.C.S. University Press, Manchester, 1908.

The book comprises a series of lectures delivered in the University of Manchester in connection with the Pilkington Cancer Research Fund. The author explains that his lectures do not cover the whole subject of cancer, but that a general outline is given dealing with certain so-called neglected points.

The subject matter is divided into four parts dealing with tumors in general, cancer, causation, and the bearings of pathology on treatment. The author makes an explanatory note that by cancer he refers to all forms of malignant diseases, and not alone to malignant epithelial tumors. Moreover, the author feels himself compelled to propose a new classification for tumors.

A tumor is defined as "a mass of cells, tissues or organs resembling those normally present in the body, but arranged atypically, which grows at the expense of the organism, without at the same time subserving any useful function therein." In this the author places a new meaning to 'atypical' to that generally adopted. He denounces the classification of tumors based on embryology as unscientific and useless, and as far as we can see, he relies entirely on the microscopic picture for his classification. In support of this he says, "Who, for instance, would classify metal goods according to the mine from which metallic ore was obtained?" We fail to see the analogy.

The new classification is based upon the nature and arrangement of the component parts. Thus, (1) Organomata are tumors composed of more or less definite organs, arranged atypically, as dermoids; (2) Histiomata are non-malignant growths, composed of tissues arranged atypically, and, (3) Cystomata are cancers in which the cells are arranged atypically. Under this new nomenclature we find epitheliomata classed among the benign histiomata, and tumors of endothelial origin are associated with carcinomata.

At the present time when so much work is concentrated on the study of tumors to determine cause, their nature, and their origin, we feel that new classifications are uncalled for. Whatever the final classification of tumors may be, we believe that this will be determined only after we are

agreed upon their origin, both as regards the tumor cells and the stimulus leading to their atypical growth.

In other parts of the book the author discusses the relation of tumors to metabolic changes in other organs.

The author has great confidence in the microscope in making a diagnosis between a benign and malignant growth. He believes that in practically all the cases an extended examination of the margins of a tumor will determine its character. We assume from this that the author believes in the malignant nature of tumor cells from their beginning.

A good description is given of the extension of cancerous growth. Under the causation of cancer the author discusses the question under two heads, the intrinsic and the extrinsic factors. The theory of the intrinsic factors is very similar to that propounded by Ribbert some years ago. The author gives no support to the parasitic theory of cancer.

Some excellent micro-photographs are given of the various types of tumors.

"Text-Book of Diseases of the Nose, Throat and Ear." For the use of Students and General Practitioners. By Francis R. Packard, M.D. Philadelphia and London: J. B. Lippincott Company.

In this work, an endeavor has been made to present the essentials of diseases of the nose, throat and ear in a form suitable to the needs of students and general practitioners. It is based upon the author's many years of experience as a teacher in a large post-graduate school, and attention has been chiefly paid to the practical aspects of the subject and to their bearing on the every-day work of the general practitioner. The subject matter is well written and up to date, and the only exception which we take to its thoroughness is the chapter relating to disease of the internal ear, where there is an entire absence of any reference to a most important disease, viz.: Suppurative labyrinthitis. It is to be hoped that in the next edition this will receive the attention it deserves.

"Clinical Manual for the Study of Diseases of the Throat." By James Walker Downe, M.B., F.F.P.S.G. Glasgow: James Maclehose & Sons, Publishers to the University, 1909.

This is a second edition in name only, for its predecessor has been remodelled, it has been almost wholly rewritten and brought up to date A considerable amount of new matter has been added, chiefly as the result of the many important advances in methods of diagnosis and treatment which have been made since the appearance of the first edition.

The book has evidently been prepared for the use of students and practitioners of medicine and surgery who desire to gain some knowledge of the diseases of the Fauces, Pharynx and Larynx, as well as of the means employed in their treatment, and in this respect the author has been eminently successful. The subject matter has been arranged under numerous headings, which facilitate reference to the various diseases. The value of the book would have been enhanced by more extensive explanations of the use of the bronchoscope in its application to the removal of foreign bodies and for the purpose of a better diagnosis of the more obscure diseases of the trachea and bronchii. The addition of several new and original illustrations in black and white, as well as coloured plates, makes the work more than ordinarily attractive.

The author is indeed to be congratulated upon the results of his labour, and the work can be confidently recommended to the general practitioner seeking information regarding diseases of the nose and throat.

PROTOZOOLOGY. By GARY N. CALKINS, Ph.D., Professor of Protozoology in Columbia University, New York. 350 pages, 125 engravings and 4 coloured plates. New York and Philadelphia: Lea & Febiger, 1909.

This volume is a worthy successor to "The Protozoa," by the same author (Macmillan Co., 1901). From Introduction to Index the book is admirable. There are some minor points on which some protozoologists will disagree with the views expressed by the author, but the book certainly does express a well-balanced and safe appreciation of the position of the protozoa as producers of disease. The student of medicine, whether graduate or undergraduate, who wishes to realize the important position occupied at the present day by the Pathogenic Protozoa cannot do better than read this book.

In the preface is summed up the purpose of the whole volume. The importance of the protozoa to the student of physiology, as well as to the student of pathology, is insisted upon; the protozoa—minute animals—have exactly the same functions as the larger metazoa. In them can be studied, in their simplest form, the many processes occurring in the larger organisms, "digestion and assimilation, respiration, excretion and secretion, irritability and fatigue, reproduction, all occur in these simple animals."

Because of his authority, Dr. Calkins, by the position he has taken in this book, will do much to prevent the irrational naming and classification of incompletely identified protozoa. He insists that the morphology

of an individual parasite presents absolutely no ground for classification and that a parasite can only be certainly named and classified when its life cycle is completely known.

The chapters have been arranged so that the reader easily acquires a grasp of the whole subject. The general morphology of the protozoa is considered in the first chapter. The next three chapters are devoted to a consideration of the physiological activities and of the lives of the protozoa. The next chapter—Chapter V—is devoted to broad consideration of parasitism and the modification it entails both upon parasite and host. The remaining five chapters are taken up by a description of the known parasitic protozoa and, shortly, of the ways in which they affect the tissues of their hosts.

Appearances seen in cancer have been described by some observers as protozoa; these, as well as many bodies accepted by some as being the cause of trachoma, smallpox, scarlet fever, hydrophobia and the Montana tick fever, are described and carefully considered.

In one particular this book is especially acceptable to one who has read much of the recent work on the pathogenic protozoa, and that is, in the courtesy with which Dr. Calkins has considered the description of the developmental cycle of *Trypanosoma noctuæ* given by Schaudinn; unlike many others, Dr. Calkins has treated it with the frank criticism deserved by any statement seriously made by a competent observer.

Organic and Functional Nervous Diseases. A Text-Book of Neurology. By M. Allen Starr, M.D., Ph.D., Sc.D., Professor of Neurology, College of Physicians and Surgeons, New York; ex-president of the New York Neurological Society. Third edition, thoroughly revised. Octavo, 904 pages, with 300 engravings and 29 plates in colors or monochrome. Cloth, $6.00 net; leather, $7.00 net. Lea & Febiger, Philadelphia and New York, 1909.

This new edition of this work is a marked improvement on former editions, both in the arrangement of the subjects and in the many additions which have been made. In all, about one hundred pages have been added to the work, chiefly on the subject of the various functional diseases of the nervous system, including a new chapter on the vasomotor and trophic disorders with a few pages on the physiology of the vasomotor system. Our knowledge of this subject is yet too limited to make this last chapter very satisfactory.

In the first part he takes up methods of examination and diagnosis, with the necessary anatomy and physiology, and with this basis laid, he proceeds in the second part to cover the great division of organic dis-

cases. In part third the functional diseases are presented, the space allotted having been more than doubled. Part four considers diseases of the sympathetic nervous system, closing the subject.

The book is well illustrated, and the plates are excellent.

The article on Localisation of Cerebellar tumors one feels might still be strengthened considerably. On the whole the style is clear and the book is well adapted for the use of students and practitioners.

C. K. R.

Retrospect of Current Literature.

MEDICINE.

UNDER THE CHARGE OF DRS. FINLEY, LAFLEUR, HAMILTON, AND HOWARD.

E. C. Dickson, Toronto. "Experimental Chronic Nephritis." *Archives of Internal Medicine,* June, 1909.

It has long been a matter of supposition that an acute parenchymatous nephritis could go on to a chronic nephritis, with all the indurative features that are so marked a characteristic of the interstitial form of the disease: and the former has been counted one of the etiologic factors in the production of the latter. This paper indicates the fact that the missing links have been supplied. It must not be supposed that this is necessarily a constant occurrence, but it is at last clear that the gradual progression of one to the other does exist. When chemicals such as potass. bichromate were used, an acute parenchymatous nephritis was produced, and a subsequent definite shrinkage of the kidney occurred in surviving animals: but no definite proliferation of connective tissue could be found. Uranium nitrate, however, appeared in the author's hands to give better results: it has, of course, been extensively used as an irritant to set up acute nephritis and the consequent œdema, but its effects as an excitant of chronic changes have merely been stated previous to this.

In acute nephritis, excited by small frequent doses, over long times, or larger less frequent but long-continued doses, the convoluted tubules and the ascending loops of Henle are most affected, the latter, strange to say, first. Scarcely any glomerular change is observed. But in cases where these doses were continued for a long time, it was found that interstitial changes began to creep in, the glomerular capsules and the tubules began to be dilated, and early puckering of the surface was observable.

In a series, in which 2.5 milligrams were given every 10 to 30 days, each dose may be said to have excited an acute attack, with albuminuria, and chloride and phosphate retention. Here the fibrosis was quite gen-

eral, and the glomerular change, contrary to what was observed in the acute cases, was very noticeable.

The evidence seems to be complete, that one can excite in animals, by the use of uranium nitrate, the lesions which characterize a chronic interstitial nephritis in man: and that this is due to an acute nephritis passing into a chronic one: sometimes this goes on to the familiar atrophic granular kidneys (and it is at times associated with polyuria).

Dr. Horst Oertel. "Epithelial Proliferation and Epithelial Giant-cells in Nephritis." *Publications of the Russell Sage Institute of Pathology.* New York City Hospital, No. 1, 1909.

This paper is interesting because it deals with the question of regeneration of renal tissue, not only as a reparative process, but also as a process of defence against invasion.

It has long been known that epithelium in a renal tubule was able to proliferate. As long ago as 1859 Beer gave this as a factor in the production of the increased size of some diseased kidneys. Mitosis of the cells has often been observed, especially in the vicinity of healing infarcts and scars of the kidney. Prutz many years ago described giant-cells in the regenerating tubular epithelium. The repair was always best observed in the vicinity of the infarcts and rarely in the infarcts themselves, though even this is said to occur. If one dare sum up, it seems as if there were no doubt of epithelium multiplying, even to the filling of tubules, but that actual new tubules arise is probably not true. Observations are thus mostly confined to operative cases: regeneration from nephritis in man is necessarily a rare observation, and Oertel's case is therefore an interesting one. The case need not be detailed: the man, aged 50, had kidneys which appeared to be the seat of a "productive nephritis," that is, evidently an interstitial nephritis in a kidney as yet unshrunken. Oertel found numerous new formed cells in the convoluted tubules, often massed together in a kind of syncytium: often cells show irregular outline, and a dozen nuclei. No clue as to their ultimate fate exists. They are clearly atypical, and from their occurring only in certain cases, and not occurring in many regenerations, some authors think they are the result of the reaction against irritation, viz.: that they are for the purpose of combat and protection, and are analogous to the proliferated endothelial cell of ordinary inflammation. The author thinks these cells phagocytic, although he was not able to demonstrate bacteria in them.

From a standpoint of criticism, it does not seem to me to be inconsistent that both of these sides of the question may be right: it is very

probable, however, that these cells proliferated for a protective purpose, and as a result of stimulation, in many cases do not fulfil any function after this; an additional argument in favor of Oertel's view, which he does not appear to make use of is this: that not yet has the giant-cell ever proved itself to be of use—it is a cell that has passed the zenith and is on the downhill path.

Ditman and Welker. "Deficient Oxidation in Relation to Nephritis." *New York Medical Journal,* May and June, 1909.

The authors have done a large amount of experimental work upon nephritics, estimating the creatinine excretion, and showing how deficient oxidation tends to increase the amount of retention of half-oxidised products of metabolism, which products are well known to be extremely toxic to the body. Seven or eight purin bases have been determined in the urine, mostly xanthine compounds, and the guanines, very toxic substances, are transformed into xanthines by pancreatic action, and by enzymes from the adrenal and thymus. All these more or less toxic purin bodies can be converted into uric acid. But this may not happen by reason of deficient oxidation. Take for example the metabolism of creatine: with good oxidation this passes through methyl hydantoine to methyl urea to urea: with poor oxidation, it passes to creatinine to methyl guanidine (a deadly poison to animals) to guanidine. In nephritics (not for the first time) the authors find that there is a retention of these toxic substances of the second group. They fed a nephritic creatinine, and found very little recoverable, and more than that, found that direct toxæmic symptoms were the outcome. They remark that this experiment does not lend itself to repetition.

Next, they bring forward considerable evidence to show that the members of the "partially oxidized creatinine products" group are actually capable of producing lesions in the kidney. They found, too, that guanidine was quickly and extensively hæmolytic. Most of the products of decomposition early in the process, i.e. the first-produced substances, tend to excite inflammation, while the later products (i.e. products nearer the *end*) tend to excite purely toxic manifestations, that is, parenchymatous change.

The authors ask themselves what are the every-day influences that affect oxidation and tend to cause or to increase nephritis: they place the injurious influences as follows: alcohol, sudden falls of temperature (not constant cold), lack of exercise, excess of protein foods, and all things which increase intestinal putrefaction. Their deductions as to treatment need not greatly concern us here as they are the logical se-

quence of what has just been said. They do not favor the strict milk diet, logically enough, and detail some findings in the cases of milk-fed cats: whereas fatty degeneration to a very great extent, of the liver, was produced, one cat showed a kidney which for fatty infiltration surpassed anything ever seen by the writer: he says he cannot imagine that such an organ could functionate. This is a weak spot in his reasoning. The real reasons against milk diet over very long periods rest on more valid grounds, namely, that the patient's nutrition cannot be kept up.

J. McC.

SURGERY.

UNDER THE CHARGE OF DRS. ARMSTRONG, BARLOW, ARCHIBALD, AND CAMPBELL.

PROFESSOR DOCTOR HANS KEHR. "Diseases of the Pancreas with Special Reference to Pancreatitis Chronica in Connection with Cholelithiasis." *Mitteil. a. d. Grenzgeb. d. Med. u. Chir.,* Bd. 20, Heft 1.

During the past five years Kehr has performed five hundred and twenty laparotomies for the relief of cholelithiasis and other affections of the hepatopancreatic system associated with chronic icterus, and has met with disease of the pancreas in one hundred and twenty-nine instances (twenty-four per cent.) classified as follows:—Carcinoma, 21; Necrosis, 5; Cyst, 1; Pancreatitis chronica, 102. Kehr attributes this large percentage to the fact that his clinic is especially devoted to surgical affections associated with jaundice, and further to the fact that he has included in these figures the slight forms of pancreatic inflammation.

The accompanying diagrams are intended to support the contention of the author that pancreatitis must necessarily be a frequent complication of biliary lithiasis, and that the intimate proximity of the opening of the pancreatic duct to the intestinal tract invites infection through the latter.

Kehr is in accord with the opinion formerly expressed by Mayo Robson, that that form of jaundice generally termed "catarrhal" is in most cases attributable to a mild pancreatitis, secondary to duodenal infection, and it is evidently the author's hope that this view will be borne out by the more extended application of the Cammidge test.

During the last two years, in two hundred and twenty operations upon the biliary system, Kehr has met with pancreatic carcinoma four times, necrosis twice, and chronic pancreatitis sixty-nine times. These seventy-five cases are discussed by the author in detail.

In seventeen cases of carcinoma of the pancreas observed by Kehr and Liebold all, with one exception, were intensely jaundiced: this constant

jaundice, rather than a jaundice of varying intensity, being suggestive of obstruction by tumor and not by stone. In only one case was sugar observed. In five cases latent gall stones were found. In ten instances the gall bladder was distended,—the most common finding in obstruction by tumor. In one instance only was there diffuse thickening of the pancreas. In two cases multiple nodules were made out.

Of the last four cases of carcinoma observed by Kehr two were fully investigated at autopsy, one giving the Cammidge test A + B —. Of the other two cases one, giving a positive Cammidge test, made uninterrupted recovery after cystogastrostomy; the second, in which the Cam-

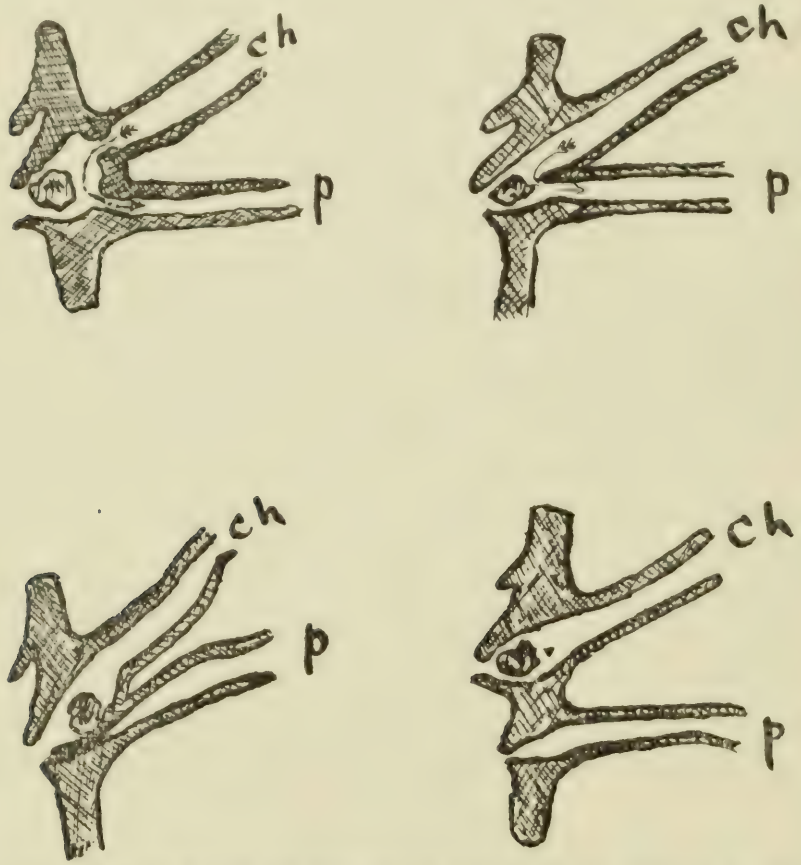

Diagram illustrating the relation of stone in the ampulla to the pancreatic duct.

midge test was absent, died after operation but did not come to autopsy.

In carcinoma of the pancreas attempts have been made to obtain radical cures by partial or total extirpation of the gland. Where the disease is confined to the tail, permanent recovery is possible. In sixteen cases of partial excision for malignant disease Mayo Robson reports eight recoveries. In seventy-one cases in all of pancreatic carcinoma observed by Kehr, thirty seemed favorable for the performance of cystogastrostomy: in the remainder the abdomen was closed without interference.

Ten of the cases subjected to this palliative measure lived more than two years. The gain in weight after operation was frequently remarkable—in some cases as much as forty pounds—so that at the end of the first year Kehr was led to hope that only a chronic pancreatitis had been present: and he very rightly urges that where palliative measures will give relief and prolong life for two years, such measures meet a most important requirement, especially in view of the fact that a patient suffering from pancreatic carcinoma develops an intense icterus early and generally succumbs within six months.

It is Kehr's experience that pancreatic carcinoma runs a painless course in the majority of cases. Where the disease remains localized in the tail or body of the gland, jaundice is absent, the symptoms of wasting and loss of appetite alone being met with.

In necrotic inflammations of the pancreas the onset is so sudden and the symptoms so severe that there is not sufficient time for the application of the present methods of investigation (urine-fæces): it is rather a question of how early and energetically action can be taken. In one of the two cases reported by Kehr there was found free bloody fluid in the abdomen, fat necrosis of the omentum, and an enlarged, firm, hemorrhagic pancreas; and when dressing forceps were thrust into the gland, turbid, bloody fluid escaped. In the second case a large cystic tumor lying behind the pylorus was encountered, which on incision evacuated at first serous fluid and later creamy pus. An area of necrotic tissue the size of a walnut was removed. Both cases ended fatally and illustrate in the author's opinion the necessity for early operation. It has been contended by Körte and Gulecke that if one, before the beginning of necrosis, improves the gland circulation by splitting the capsule, destruction of the gland may be prevented.

The diagnosis of acute pancreatitis presents numerous difficulties. Owing to extreme distention one may be unable to make out the swollen pancreas. The severity of the pain should suggest this condition. The clinical picture may closely simulate that of ileus. If in the course of an attack of biliary colic there is a sudden and severe exacerbation of all symptoms, pancreatitis should be thought of. As an aid in distinguishing such symptoms from gall bladder perforation, it should be borne in mind that in the former the tenderness is more in the middle line and in the left hypochondrium.

Both of the cases referred to had had repeated attacks of severe colic. Case II. was sent to the hospital as one of intestinal obstruction. Necrosis had begun in the first case probably four days before admission to the clinic, and in Case II. at an even earlier period.

Chronic pancreatitis is either a sequence of an acute attack or it comes on gradually. Pancreatitis as the result of biliary lithiasis is observed most frequently in association with stone in the common duct. In Kehr's last series of two hundred and twenty cases chronic pancreatitis was met with sixty-nine times. The author finds that since the establishment of the Cammidge test as a part of the routine in connection with the preoperative investigation of cases, more attention has been paid to the condition of the pancreas in biliary disease.

In chronic pancreatitis unassociated with stone Mayo Robson has effected a cure in ninety-seven per cent. by the establishment of a connection—preferably a cystogastrostomy—between the gall bladder and the intestinal tract.

Chronic pancreatitis secondary to stone formation is of course more frequently met with where a stone obstructs the common duct, as in such cases co-existing cholangitis is generally present. Of seventy-six cases of gall-duct stone operated upon by Kehr during the past two years, pancreatitis was present in fifty per cent., whereas in seventy-six cases of simple cholecystitis calculosa the pancreas was found chronically inflamed in only fourteen per cent. The co-existence of pancreatitis undoubtedly has an important bearing upon the prognosis in operative procedures upon the gall passages.

In cases of chronic pancreatitis Kehr has avoided any operative measures directed against the gland itself, relying solely upon the drainage established after the removal of the common or cystic duct stones. Reference is made, however, to the method devised by Czerny whereby the duct in its anatomical relation to the pancreas may be dilated with forceps; as well as to that of Martini, who advises the splitting of the capsule of the pancreas if such can be carried out without the danger of hemorrhage.

Kehr in his former work advised abstention from operation upon the gall passages where sugar was present in the urine. Recently, however, he finds himself in a position to alter somewhat his attitude in this respect. It is his belief that in the earlier stages of pancreatitis the destruction of the islands of Langerhans and the progress of the diabetic symptoms may be arrested. He therefore makes it a rule to operate upon cases where sugar is present if at the same time the Cammidge test points to the presence of pancreatitis. Where, however, the diabetic symptoms are severe and the Cammidge test negative, he refrains from operative procedure.

Finally Kehr deals with his personal experience with the Cammidge test, carried out according to the method described by its author

(*British Medical Journal*, May 19, 1906). While Hallion, Ham, Willcox and others deny the value of this test, Mayo Robson, Duval and Quenu are enthusiastic partisans. The fact that it is sometimes positive in arteriosclerosis, pneumonia and appendicitis detracts somewhat from its worth as a specific test. Maass in twenty reactions which were checked by autopsy got a positive result in fourteen and a negative in six. Of these twenty, fifteen agreed with the histological finding, that is to say, the test proved reliable in seventy-five per cent. According to Maass this test is a material addition to our methods of clinical investigation.

In the thirty cases investigated by Kehr, the test failed in only four instances: that is, it was positive in eighty-two per cent. To parallel these observations control tests were carried cut on thirty cases, including patients suffering from cœcum tuberculosis, appendicitis, etc., as well as healthy individuals. The test was positive in one case only, and that in an individual whose urine was investigated after a generous amount of alcohol had been taken the evening previous. Kehr concludes that in disease of the pancreas, especially in the chronic and inflammatory forms, the Cammidge test seems to be of definite worth.

To differentiate, however, between pancreatic carcinoma and pancreatitis is especially difficult owing to the fact that not infrequently an area of chronic inflammation surrounds the cancerous growth.

Kehr admits that his findings in these thirty cases have greatly altered his views on the indications for operative interference. Up to the present time operation was undertaken only in cases of acute or chronic empyema or chronic obstruction of the common duct, or on a relative indication in cases where chronic invalidism developed. Kehr now recommends operation in the latent stage if the Cammidge test is positive, —in other words if the pancreas is diseased—with the following qualification: that the Cammidge test prove positive a second time after a lapse of four weeks, during which time the patient has been submitted to a course of rest, dieting, etc.

In those cases in which chronic pancreatitis is diagnosed and confirmed by the Cammidge test, but in which no symptoms of lithiasis have been manifest, Kehr recommends rest in bed and the application of hot fomentations, dietetic measures and the internal administration of gland extract and hydrochloric acid. Schmieden prescribes iodide of potassium: Mayo Robson, calomel. One should not, however, prolong this form of therapy in view of the favorable results of operative interference.

E. M. v. E.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The first regular meeting of the Society was held Friday evening, October 1st, 1909. The President, Dr. W. Grant Stewart, occupied the Chair.

LIVING CASES.

Dr. A. MacKenzie Forbes presented a case of deformity of the hip joint upon which a transtrochanteric osteotomy had been done with remarkable improvement.

Hanford McKee, M.D., showed a case of Spring Catarrh.

SPRING CATARRH.

Hanford McKee, M.D.—Spring Catarrh is the name given to a conjunctival disease, because of the exacerbation of the symptoms during the warm weather of the spring and summer. The clinical appearance is a very definite one. The palpebral or bulbar conjunctiva may be affected, rarely both. The palpebral form is not rare and somewhat resembles tracoma. Spring catarrh involving the bulbar conjunctiva is not common and is especially rare in this district. The case being shown here is most typical in history and clinical picture.

This young man, a Swiss, came to me the other day, complaining of severe itchiness of the eyes, which became inflamed during the recent warm weather. He has had the condition for twelve years, the symptoms subsiding during the winter, only to begin anew in the spring. If you examine him you will see on each side of the cornea, raised masses which extend over the edge of the cornea. These growths are hard and have the whitish colour so characteristic of spring catarrh. There has been very little secretion. The history in this case makes the diagnosis easy. A snipping, however, was examined, to exclude tuberculosis, and the histological picture was typical.

The etiology is as yet unknown, search for a bacteriological cause has so far given negative results. The treatment consists in ameliorating the symptoms, astringents do very well. It has been treated in a grea many ways, lastly by radium.

REPLY.

Hanford McKee, M.D.—With regard to the acute inflammation of the conjunctiva present in this case, I would not like to have any one think that this acute condition is spring catarrh. The inflamed conjunctiva is due to the patient having had his eye irrigated with bichloride solution this afternoon, instead of boracic solution. I quite under

stand that in spring catarrh there is very little secretion, although it is quite possible to have spring catarrh associated with a definite conjunctivitis as that which Morax-Axenfeld describes.

What I wished to call the attention of the meeting to, was the growth on the bulbar conjunctiva, on each side of the cornea.

PATHOLOGICAL SPECIMENS.

Oskar Klotz, M.D.—The two specimens that I wish to show this evening are of the same class, adenomatous or papillomatous conditions of the bowel in which also malignant disease was present.

ADENOMATA OF THE BOWEL AND MALIGNANT DISEASE.

I wish to bring before you this evening two specimens which have recently come under my notice, which illustrate very well the association between the so-called adenomata or papillomata of the bowel and cancers in the same organ. This has not infrequently been commented upon by Ribbert.

The first case was that of a young girl, aged twenty-three, who had been operated upon for malignant disease in both ovaries. The condition found in these organs was that of a malignant ovarian cyst-adenoma. Six months later the growth recurred in the pelvis, and many metastases developed. At autopsy a rather remarkable condition was found in the large bowel. The mucosa from the cæcum onwards was studded with numerous papillomatous masses, having tumor-like heads, and constricted pedicles. These masses varied in size from a small shot to a hazel-nut, and were covered with a rather spongy mucosa, which in many of them showed a superficial ulceration with a necrotic slough. The pedicle, on the other hand, was narrow, and seemed to be of thin mucous membrane. As the descending colon was reached, the general mucosal surface was reddened and showed extensive necrosis encircling the bowel.

In the sigmoid there was a narrowing of the lumen, with an extensive overgrowth of the tissues from the mesenteric border. In this area a huge nodule was formed, circular in outline and heaped up along the border, the mass measuring 2.5 cm. When open, one was reminded of a gastric cancer with a flattened border. The mass measured 8 x 5 cm. Along the lower border the mass took a polypoid character, with a superficial necrosis. Just below its lower border was a soft pedunculated polyp, with a ragged and necrotic surface. A second and rather cancerous mass was found at a distance of 3 cm. below the one above described. This mass formed a rather elastic polyp, with a depressed centre and superficial necrosis. It measured 3 cm. in diameter. On section, the new developing tissue appeared to originate from the bowel wall itself. The small intestine and rectum were without definite change.

The microscopical sections of several papillomata in the colon presented a structure with a nodular outgrowth from the mucosa of the large bowel, in the centre of which was a core of fibrous tissue and blood vessels. The mucosa lying over the out-growth was quite regular and showed no tendency to infiltrate into the submucosa. There was a considerable leucocytic infiltration between the tubules of the mucosa, while on one side of the nodule there was some necrosis of the superficial tubules. In no case was there evidence of malignancy in the epithelial structures.

Sections taken from the base of the tumor mass in the sigmoid showed a tissue with a dense fibrous framework, in which were embedded strands and alveolar masses of epithelial cells. In some places these alveoli closely resembled epithelial ingrowths, such as developed from the mucosa of the large bowel. In places again this epithelial ingrowth showed a colloid degeneration. The epithelial cells showed solid strands of cells which invaded in the deepest part of the bowel wall, and also into the mesentery. The whole picture strongly resembled a cancerous tumor from the large bowel.

The second case was that of a man, æt. sixty-two, who gave a history of some rectal trouble ten years previously. Five years ago, he was operated upon, and a papillomatous mass removed from the rectum. This mass was only removed superficially and the microscopic examination of this tissue showed it to be of a papillomatous nature. Recently he again came to the hospital, with a papillomatous tumor in the rectum. Snippings from the superficial processes of this tumor again showed characteristics of a benign papillomatous growth. However, when the lower portion of the rectum, including the deep tissues, was removed, it was found that there were epithelial infiltrations into the outer walls of the bowel, and also into some of the tissues about the rectum. These epithelial new growths consisted of strands of atypical characters of epithelial cells, which in many cases showed colloid change. Inflammatory reaction was lacking about these epithelial growths.

We have, therefore, two very interesting pathological specimens before us. Both of these specimens present superficial new growths, which when considered alone are benign in character. In each case, too, there is the presence of malignant infiltration into the structures of the bowel.

In the discussion of both of these cases it is necessary to consider cause and effect, and determine which of the two processes was primary. In the second case the evidence seems fairly clear for the patient had a papillomatous growth removed five years previously, and this growth had recurred along with a cancerous development. It would appear then that

the papilloma, which histologically could not be recognized from the benign type, had a malignant tendency.

In the first case, the matter is a little more difficult, since we have no evidence at hand indicating which type of tumor at first developed. It is possible that the papillomatous condition of the large bowel was the result of a chronic irritation brought about by the slight constriction and necessarily slight obstruction by the annular cancerous condition in the sigmoid. We are familiar with the development of such conditions, colitis polyposa following chronic dysenteries. In these, too, the papillomatous outgrowths may become malignant.

I believe that there is a type of tumor which, although the microscopical features speak otherwise, has a malignant tendency, and it is quite possible that these two cases illustrate this type, that is, that we have to do with an adenomatous condition which at any time may become malignant.

E. W. Archibald, M.D.—What Dr. Klotz has said deserves close attention. The fact has been often, I think, overlooked in the past and has sometimes not only been overlooked but considered in an entirely opposite sense. For instance, some years ago I operated on a papilloma of the bladder wall, taking it out bluntly, but apparently thoroughly with the finger. Clinically the growth seemed to be benign; and the pathological sections seemed to show it to be entirely papillomatous, that is, benign. The condition recurred after over two years, and a second operation, similar to the first, was done at the end of the third year. A third time, after some months, the patient came under observation; but no further operation was considered, as its malignancy was recognised. These benign epithelial tumours are certainly in their beginnings papillomatous or adenomatous; but, as Dr. Klotz says, they may very likely be even in the early stages also malignant though unrecognisable as such clinically, and though pathological sections frequently fail to discover malignancy, owing to the fact that the surgeon does not often remove the bladder wall with the growth.

A. Lapthorn Smith, M.D.—I think a very important observation is that, although these tumours may be benign at the beginning, before long they become malignant and therefore the sooner they are removed the better.

A. E. Garrow, M.D.—The patient from whom the colloid cancer of the rectum was obtained, and which has just been shown to this Society, came under observation about five years ago, stating that a large mass had presented at the anus at each act of defecation during the last four or five years.

Histological examination of a small portion made by Dr. Keenan revealed a benign growth.

Removal was readily effected by cutting through the mucosa and around the cauliflower-like mass one-half inch from the pedicle, and then loosening the part from the subjacent connective tissue. There was no clinical evidence of infiltration at the base.

When he came under observation for the second time, a few weeks ago, a much larger cauliflower-like mass presented at the anus on straining. This had been increasing in size for the last two or three years, giving rise to daily hemorrhages which though not profuse had led to a profoundly anæmic condition.

A small part removed for examination was again declared to be benign by Dr. Keenan.

The growth on this occasion almost encircled the bowel and extended upwards for some distance. To remove it, a modified Whitehead's operation was attempted, but it was seen that the separating of the mucosa from the muscular coat was impracticable, not so much on account of infiltration but from difficulty in recognizing the anatomical structures. As the dissection proceeded the friability of the tissues disappeared, and separation through the submucous layer was carried out. The mucous membrane after removal of the growth was readily drawn down and stitched to the cut skin.

Since the operation, in spite of forced feeding and suitable medication, the patient remains very anæmic. Several examinations place the hæmoglobin estimate at 15 per cent. to 18 per cent.

To-day transfusion of blood by Crile's method, from the radial artery of his son, proceeded for one hour and a quarter, with apparently much improvement in his subjective and objective condition. Examination immediately after operation showed 25 per cent. hæmoglobin.

Note.—Since recording the above notes it may be of interest to add that this patient has returned home. A day or two following the transfusion he insisted upon being allowed out of bed and seemed to gain in strength and appearance quite markedly.

HAEMATOPORPHYTINURIA.

H. B. Cushing, M.D., read the report of this case.

A. Lapthorn Smith, M.D.—There are many important points which I think might come up for discussion in this connection and one is the serious evil of repeating prescriptions. The case reported to-night is not the first nor the one hundredth case I have heard of where life was impaired, if not lost, by patients repeating prescriptions for themselves and many of their friends with totally different diseases. I was very

pleased to see on a prescription written by one of our members, a stamped notice to the effect that "this prescription must not be repeated without an order in writing." This is a very good plan and one which our friend has probably come to use by having had some severe lessons, as in the case just cited. With regard to the examination of specimens of urine by Dr. A. A. Bruère, of the Royal Victoria Hospital, I can also testify to the very great help he has been to me in my difficult cases; he is marvellously accurate.

I have not heard an expression of opinion by the members of the Society for a long time with regard to Sulphonal, and I think some of them ought to give us their experience of this and similar coal tar drugs. At one time I had hoped that we had at last found the harmless hypnotic, but after using it for three or four years, I came to the conclusion that it was extremely depressing. I hope some evening some member who knows all about these hypnotics will give us a scientific and correct opinion on them.

RENAL CALCULUS.

J. M. Elder, M.D., read the report of this case which appears in this number of the Journal.

F. J. Shepherd, M.D.—I think this case of Dr. Elder's as reported by him to-night illustrates very well the methods of modern diagnosis and how much easier it is now to make a diagnosis of a kidney condition than it was 25 years ago. I did the first operation in Montreal for the removal of stone and we had no such methods then for diagnosis as we have now. We used our powers of observation. My experience is that there is a great deal of hæmorrhage of the kidney in some of these cases and when this occurs it means extensive disease. I would like to ask Dr. Elder when he delivered the kidney whether he could detect the stone by feel with the fingers. I remember a case Dr. Finley sent me, a young woman, a niece of a doctor who thought her symptoms were hysterical. We both concluded that there was a stone of the right kidney, but on delivering the kidney I could not feel any stone at all. I opened the lower half and felt all the infundibula and was just giving up when the patient suddenly gave a lurch and my finger in the kidney tore up a space in the upper zone and came against a large rough stone. I sewed up the kidney and she made an uninterrupted recovery. This shows that even when you have the kidney before you and with careful palpation the stone may be overlooked. The present case illustrates very well the modern methods of diagnosis.

A. E. Garrow, M.D.—There are several points in connection with the diagnosis of renal and ureteral calculus that are well worth considering.

Dr. Elder in his paper has emphasized the importance of modern methods in diagnosing renal stone, but as a matter of fact there is no one pathognomonic sign of renal or ureteral stone.

Examination of the separated urines only shows that one kidney is the seat of some inflammatory lesion,—a shadow in the kidney region or along the course of the ureter may be due to some condition quite foreign to either structure,—a stone may be present and a perfect skiagraph interpreted by an expert may show no evidence of its existence.

Attacks of renal colic frequently occur in the absence of stone.

For these reasons the presumptive evidence of stone can only be established by a careful consideration of all the facts obtainable, while the diagnosis is only complete when the stone is exposed at operation.

It is well known that stone in the upper half of the ureter may very closely simulate stone in the kidney, when in the lower half symptoms suggesting vesical calculus are frequently present.

I would like also to emphasize the importance of employing carefully placed mattress sutures in closing exploratory wounds in the kidney, to prevent the post-operative hæmaturia referred to by Dr. Elder.

J. M. Elder, M.D.—Dr. Shepherd has asked if the stone could be felt. I stated that the stone could be felt perfectly well and I just had to make a stab wound and take it out. We have all seen cases where kidneys have been explored and nothing found, and also kidneys that have been explored with serious result, that is hæmorrhage so great that it had to be removed. At the same time, we all remember the advice of our old teacher in surgery; viz.: "in operating for stone of the kidney before a class, be sure and have a stone in your pocket." In answer to Dr. Garrow, my own feeling is that the more one reads X-ray plates the fewer mistakes will there be. It is a difficult thing to read a skiagram properly. There is, of course, nothing absolute about any skiagram, but in the hands of an expert it is an undeniable help. With regard to the sutures, in this case I used the mattress suture of heavy catgut for the kidney substance. I feel very strongly that non-absorbable sutures should not be left in the kidney. As Morris has repeatedly demonstrated, they predispose to stone formation. The moral I specially wished to point by this communication is now, surgically, well known: Never operate upon any kidney until you are sure of the other one.

CONTROL OF HEMORRHAGE WITH THE MOMBERG TUBE.

H. M. Little, M.D., read a report of two cases in which this tube had been employed in post-partum hæmorrhage with excellent results.

Wesley Mills, M.D.—I was interested from a physiological point of view in the case which Dr. Little has related to us to-night, particularly

as to the question of possible paralysis or paresis, for in the lower animals extensive degeneration of the spinal column can be produced in rabbits by the occlusion of the abdominal aorta for a very short time. I repeated these experiments on rabbits and cats and found that the cat reacted entirely differently from the rabbit. Nevertheless there seems to be so little reported on this that I think it would be worth while if attention were directed towards the possible evil results from this constriction of the aorta in the human subject.

Dr. W. W. Chipman.—I should greatly like to thank Dr. Little for giving us any means for combating what we all know to be one of the most serious things which can happen to the practitioner, namely:—post-partum hæmorrhage. The use of this tube really means the use of the Esmarch, only in these cases the Esmarch is applied in rather an unusual situation. I would like to ask Dr. Little one question and that is, whether or not the girth of the patient would or would not deter the efficacy of this tourniquet. In a thin patient it doubtless could be easily, and I have no doubt efficaciously applied, but it seems to me that if the patient were stout that it would only be with great difficulty that pressure could be brought to bear upon the deeply lying abdominal vessels. However, the experience of those who have used it, including Dr. Little himself, is certainly very favorable. The tube itself is a very simple affair and quickly applied, and the wonder almost is that such a means of controlling post-partum hæmorrhage has not been conceived before.

J. C. Cameron, M.D.—Just one word of warning regarding the use of the tube for the control of hæmorrhage in puerperal cases. Recently several cases have been reported of injury to the viscera (spleen, liver, etc.) after the application of the tube. The injury was attributed to the fact either of the tube being applied too high or of the intestine being full of undigested food. The tube seems to be safe enough when the bowel is fairly empty, but may be dangerous after a full meal. If we are to recommend this method of treating hæmorrhage, it should be with the warning that the tube must not be applied high up, nor after a full meal.

H. M. Little, M.D.—With regard to the stoutness of our patients I would say that one of our patients was very thin and the other very stout and that the method was efficacious in both.

PRESIDENT'S ANNUAL REPORT BY J. ALEX. HUTCHISON, M.D.

Members:—With this meeting it is my duty to turn over to my successor the responsibilities of the high office to which, in your generosity, you elected me to fill twelve months ago. I well recognize my shortcomings in my effort to maintain the high standards which have been

set by the many eminent members of our profession who have occupied this position. I desire now to express my appreciation and can only say that my year as President of this Society will ever remain a memorable one in my professional life.

There have been during the past year 18 regular meetings. There has been an average attendance of 44 members. The largest number present at one meeting was 86. The smallest number present was 20.

I am glad to report that the smallest number was the result of a very pleasant incident connected with the marriage of one of our distinguished younger members, showing that the associations of love are still in the hearts of medical men as against the purely scientific aspect of their lives.

There were at the beginning of the year 188 regular members of this Society. During the year 8 new members were taken in. We lost by resignation 5 members and there was removed by death 1, Dr. A. Brodeur, leaving at the present time a total membership of 191.

I regret that among the resignations two were of members who had long been associated with the work of this Society. One of them had been a member since 1873, the other since 1890.

The Society was privileged during the year in having addresses from two eminent foreigners—one a distinguished member of the German, the other of the United States profession. These addresses were most interesting and were well attended. Both the visitors expressed their great pleasure at being present.

The practice of inviting distinguished members of the profession to give addresses from time to time is an excellent one, and one which I trust will be continued. There is always much to learn from a new point of view. I would like to throw out the hint that, from time to time, members of the profession from other Canadian cities be invited to address this Society. Although most of the older members of this Society, through attendance at meetings of the Dominion and Provincial Medical Associations, have come to know many members of the profession in other parts of Canada, there are younger members of this Society who have not the opportunity to attend the larger Associations and who, I am sure, will have great pleasure in making the acquaintance of their brethren from other parts of the country.

One notable event during the year has been the meeting of the Tuberculosis League which had present at its meetings many eminent authorities on this important disease. The exhibition associated with the meeting must have been of great value in bringing to the attention of the public the preventive measures now so well recognized. This Society

was kindly invited to associate itself with the work, and the Committee of Arrangements was good enough to ask your President to occupy the chair during one of the meetings.

A Committee on a very important subject—that of the Montreal water supply—went to much trouble in preparing a report which was recently submitted for your consideration. I regret that the full work of this Committee was not completed during the year. Owing to many difficulties and the fact that the Committee was associated with the representatives of the Société Médicale Française and the Canadian Society of Civil Engineers, some difficulty was met in arranging meetings. A report, however, will be presented to the Municipal Authorities at an early date. It is hoped that this report will bring to the attention of the public the urgent necessity for an improved water supply for this great city.

I have been somewhat discouraged from time to time at the small number of members present at our meetings and the lateness of the hour at which many members, who do attend, arrive. Were it not that this year has been no exception to preceding years, I should have felt that your President was in some way responsible for it. It has been stated that the presence in the city of other Medical Societies, formed largely of members of this Society, and associated with the work of the hospitals and colleges, is in a measure responsible for the small attendance. I find, however, that the members of these smaller Societies are among our most regular attendants and that the blame cannot be laid entirely at the door of these organizations. I am very strongly of the opinion that this Society will be the stronger if, by any chance, it were considered desirable to absorb other associations. In union there is always strength.

During the past few years there has been a marked change in the attendance—a very noticeable falling off of the senior members of this Society has been apparent. The contribution to the work of the Society has been largely from the younger members. While it is desirable that the younger members contribute to the work, this should not mean that the older members are not expected also to add their more experienced views on the many topics which are constantly before us. One or two original articles of research from younger members were of a notable character, showing that much time and original investigation had been expended and final conclusions suggested only after long-continued research. These papers would have done credit to the mature judgment of much older and better known men.

There are in the city a considerable number of younger members of our profession who have not, so far, seen fit to ask for the privilege of

membership, and I would suggest that a Committee be appointed to consider the possibilities of membership, as there can be no doubt that this Society must be of great advantage to every member of our profession who attends these meetings. The individual members must gain both in a professional and social sense, and a better "esprit de corps" be established.

It has been stated that the annual fee is a burden and one of the causes of preventing these men from joining this Society. It might be well to consider the possibility of charging a nominal fee for the first two or three years of membership.

I am glad to report that we have been promised portraits of the late Sir William Hingston and the late Dr. George E. Fenwick, the only deceased past Presidents of this Society whose portraits are not now hanging on the wall.

I desire to express our thanks to those of our members who showed living cases and who presented pathological specimens. The presentation of living cases and pathological specimens adds much to the interest of our meetings, and those members who present the cases are put to some trouble and expense. From time to time it has been thought by some members that if our rooms and meetings could be associated in some way with some social attractions, it would add to the usefulness of this Society. Personally I believe the Society should continue to fulfil its purely scientific character; at the same time, I would favor any reasonable social attraction which would stimulate and maintain interest in the organization. From personal observation I am prepared to say that these expensive and handsomely furnished rooms offer little attraction during the day time to any member. It is quite true that the medical journals and other literature to be found on the tables are not used sufficiently to warrant their expense. The explanation of this is that at the college and at two of the larger hospitals small journal societies exist, and all current medical literature is kept on file in the reading rooms of these institutions, and these are much used by our members, not only those who have appointments in these institutions but by many members of the profession who from time to time have occasion to visit these places. It has always seemed to me that the rental paid for these rooms might be avoided if it were possible to provide the use of the rooms for other organizations. It has been suggested that in the course of time the University Club may develop a hall with subsidiary rooms and that these smaller rooms could be kept permanently for the use of a particular organisation, whilst the large hall could be used as a common meeting place of a number of Societies. Should such a development

occur I am of the opinion that it would be to the benefit of this Society to take advantage of the same.

In closing I have again to thank you for the honour you have done me, and for the consideration you have shown me during my term of office, and I ask for my successor, who I am sure will more worthily fill the position than I have done, the same kind treatment and consideration.

ADDRESS OF THE INCOMING PRESIDENT. DR. GRANT STEWART.

To be President of the Montreal Medico-Chirurgical Society is an honour indeed, and worthy the ambition of every member of this Society. Two decades have come and gone since I joined the ranks of this Society, and as I stand at this point and look back, what changes have taken place!—changes in the membership; changes in the science of medicine. The facts of those days are the fallacies of these days.

In those days none of these pictures hung upon our walls. Full of life and energy and enthusiasm the originals were with us and moved in our midst. They have left us, in body; although gone they are ever "cherished in the amber of memory."

They were great men, all of them. To know them was to love them. It behoves us to maintain the traditions of these by-gone days and live up to the standards they set us, and to pray that their mantle may fall upon us.

Who can forget the dignity with which R. Palmer Howard filled this chair? Can we who were his students ever forget his magnetic enthusiasm, his cultured eloquence, his courtly presence? Who of us did not feel that we sat at the feet of a master?

I heard Dr. Osler refer to him at the British Medical Association in Belfast this summer as the busiest practitioner he ever knew. And yet notwithstanding this, he read every book, magazine and monograph on his subject, and did a great deal of his reading driving from one patient to another. This many of us can verify.

Who of us who had the honour of knowing George Ross can forget his cheery manner, his universal kindness to rich and poor alike. His kindness, his honesty, his dogmatism were well known. As a diagnostician he was a marvel. An epitaph I saw in Glasgow Cathedral would suit him well:

> "And when his physics force oft failed,
> His pleasant purpose then prevailed.
> Heaven has his soul—His corpse this stone.
> Sigh passenger and so begone."

In George Campbell we had the highest type of the earnest, painstaking, skillful, forceful Scottish surgeon.

I cannot refer to James Stewart without a feeling of filial affection. Few there are who do not miss him. Perhaps it was not his genius which made him great, but his largeness of heart, his genuine honesty, and his quiet, shrewd, Scotch commonsense. He was intensely human.

Buller was a true type of a genius—he stood in a class by himself. Brusque of manner yet within there beat a true heart open as day for melting charity.

Dr. Reddy, the busy physician, full of genuine Irish wit, F. W. Campbell, Dr. Craik, Sir William Hingston—most of them have just left us; —we cannot forget them. We would not if we could, nor could we if we would. To them the words of Robert Louis Stevenson are appropriate:

"The physician is the flower (such as it is) of our civilization: and when that stage of man is done with, and only to be remembered to be marvelled at in history, he will be thought to have shared as little as any in the defects of the period and most notably exhibited the virtues of the race."

These were master minds in medicine, who, in their day and generation, shed lustre upon our noble art and maintained in apostolic succession the high reputation of the Montreal Medico-Chirurgical Society.

Many changes have taken place in the history of medicine in these 20 years. We live in a fast age and much is compressed in these years. These changes have been discussed before this Society,—the wonderful developments in bacteriology, in surgery, in medicine, antitoxin, the X-ray, and many other subjects. Things now are done that were not even dreamed of in previous years, and medicine has been built upon a more scientific foundation.

We have seen the advent and growth of specialism—in many ways a great advantage, perhaps, in some ways carried to extremes. Will the next 20 years see the extinction of the family doctor? I hope not. Osler puts it well when he said: "The Family Doctor, the private in our great army, the essential factor in the battle, should be carefully nourished by the schools and carefully guarded by the public. Humanly speaking, with him are the issues of life and death, since upon him falls the grievous responsibilities in those terrible emergencies which bring darkness and despair to so many households."

Much has been learned from the pathological specimens presented; much from the papers and discussions thereon; and much from the many interesting reports of cases which, from time to time, have been brought

before the notice of this Society. I have been at many conventions and congresses, and I am free to say that here in our own Society papers have been read and discussed which would grace any congress.

One of the great advantages of an association of this kind is the good fellowship it encourages. The men are thus brought together. And I think, in such an arduous profession as ours, this feature should be cultivated still more.

As I look back I have found that the men who are at the forefront of medicine in Montreal are amongst the most regular attendants at the meetings of the Society; they are our leaders. To quote Osler again:

"The well-conducted Medical Society should represent a clearing-house in which every physician of the district would secure his intellectual rating, and in which he could find out his professional assets and liabilities. We doctors do not take stock often enough, and are apt to carry on our shelves stale and out-of-date goods. The Society helps to keep him on up-to-date lines and enables him to refurnish his mental shop with the latest wares. Rightly used, it may be a touchstone to which he can bring his experience to the test and save him from falling into the rut."

One of the hopeful features of this Society is the number of young men amongst its members. I congratulate them and I would urge upon the hospital housemen not to neglect such an opportunity as now presents itself to them, and which may never occur again. Now is their accepted time. Now is their day of salvation. And while on this point I would urge that as opportunity offers the young man should attend not only his local Society, but when he can, the Provincial, the Dominion and Imperial Conventions, and thus keep in touch with the men and advances of the times. One may learn much from the reading of a paper, but much more from hearing the man behind the gun. And I would recommend them, in addition, to drink from time to time at the fountain-head of the great medical centres abroad. In this way Chauvinism is averted and perennial youth maintained and arteriosclerosis of medical enthusiasm prevented.

Gentlemen, we have entered upon another year's work, and while in some ways the success may partially depend upon its officers, its real success depends on the enthusiasm and energy of its rank and file. An interesting series of papers will be presented. Case reports and pathological specimens are to be brought before us, and now, with all our hospitals, our universities, our specialists, and the great wealth of material at our disposal, we should have no difficulty in having an interesting and instructive winter.

As usual, we will have some addresses from outsiders, I think very likely we may have an address from Dr. Philp, who comes here to open the Royal Edward Sanatorium. So, on the whole, we expect to be able to present you with a good bill-of-fare, and we hope that "good digestion may wait on appetite and health on both."

It has been one of my dreams to see us—some day—settled in a home of our own, on the principle of the Medical Institute in Belfast. Some suggestions have been made which may possibly take more definite shape. All things come to him who waits.

I could not close without congratulating the Society on its past President. He is a man worthy of the position. I have always admired Dr. Hutchison, his courtesy, his honesty of purpose, his *suaviter in modo* and *fortiter in re*. To associate with such men is one of the delights and privileges of our profession. And it is the life and practice of such men which raise Medicine above what Osler calls the dead level of a business.

We thank him for what he has done for the Society. We wish him God-speed in his work, and we hope that for many sessions to come he may still stimulate us with his enthusiasm.

Gentlemen, allow me to thank you for the great honour you have done me, and I can assure you I deeply appreciate it. And as far as in me lies I shall do my best to further the interests of this Association, and so maintain the traditions of the past.

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TONSILS AND ADENOIDS.

BY

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Founded on the experience of 7,000 cases.

In the second visceral cleft is developed an almost complete circle of lymphoid tissue. On each side of the pharynx is the faucial tonsil, at the base of the tongue and anterior to the epiglottis is the lingual tonsil, above and behind the soft palate is the pharyngeal tonsil commonly known as "adenoids," and at the pharyngeal orifice of the Eustachian tube is a considerable mass of lymphoid tissue known as the "tube tonsil" of Gerlach. The faucial tonsils or what are commonly known as the "tonsils" begin to develop during the fourth month of embryonic life, and at birth they are histologically complete. Their size increases until the age of three or four years, then normally they begin to atrophy, and this goes on till about the age of puberty when they are nearly completely gone.

The palatoglossus muscle, which forms the anterior pillar of the fauces, unites above in the soft palate with the palato-pharyngeus muscle which forms the posterior pillar of the fauces, and at the angle of meeting of these two arches the supratonsillar recess is formed. In this second branchial cleft lymphoid tissue develops from cells of the hypoblastic layer of the embryo.

At the junction of the foregut with the stomatodæum, that is the pharynx with the mouth cavity, a considerable constriction takes place. There are two folds of mucous membrane here that deserve special mention. One fold stretches across between the two pillars of the fauces just beneath the soft palate, and on account of its shape has been called the plica semilunaris. This fold forms the inner boundary of the supratonsillar recess. The other fold stretches across from about the lower

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half of the anterior pillar of the fauces to the most prominent part of the tonsil and this has been called the plica triangularis. If these two plicæ are well developed the tonsil may be almost completely hidden. The lingual tonsil is produced by a proliferation of lymphoid tissue from an accessory nodule at the base of the faucial tonsil.

Now from slight developmental peculiarities different clinical varieties of tonsils may be described.

(a) The imbedded tonsil. This is the normal type of tonsil in a child up to the age of three or four years. Looking into the throat you can scarcely see any tonsillar tissue, but on making the child retch, two globular masses come out below the soft palate and nearly touch in the middle line. This type of tonsil is hidden by the anterior pillar of fauces and by the two plicæ, namely semilunaris and triangularis.

(b) Sessile or flat tonsil is the normal type of tonsil found in middle life. If the tonsillar tissue of the young child is not subject to much inflammation it begins to atrophy after about the fourth year of life, so all that remains in middle life of the large tonsillar mass of the child is a few scattered masses of lymphoid tissue.

(c) If, however, the tonsils are subject to considerable inflammation after the fourth year of life, they enlarge instead of atrophying and this may go on until adult life. This inflammatory enlargement produces what is known as the prominent tonsil. It is due to a proliferation of the lymphoid tissue at the outlet of the tonsillar sac. These tonsils are easily seen when looking into a patient's throat. They stand out as if they were on a pedicle.

(d) Another type of tonsil is where the lingual prolongation is very well marked. The faucial and lingual tonsils seem to be one continuous mass of lymphoid tissue.

Anatomy:—The tonsils are masses of lymphoid tissue partially surrounded by a capsule and situated between the pillars of the fauces. The capsule is absent on the pharyngeal surface of the gland. Areolar tissue separates the capsule from the Superior Constrictor muscle of the pharynx. The pharyngeal surface of the tonsil is perforated by a number of orifices which lead into the tonsillar crypts. These crypts vary in number from eight to twenty. They are usually separate and pass completely down through the tonsillar tissue to the capsule. Rather more than half these crypts open in towards the pharyngeal isthmus, but the remaining ones open into the supratonsillar recess. If the plica semilunaris is well developed it is very difficult for this cryptic secretion to get free from the supratonsillar recess. Tonsillar calculi occasionally form from this retained material. Quinsies are also frequent in such

cases. In some cases the supratonsillar recess extends down on the external surface of the tonsil into the areolar space between the tonsil and the Superior Constrictor muscle of the pharynx.

Blood Supply:—The tonsils are well supplied with blood. The chief arteries are the tonsillar branch of the facial artery and the dorsalis linguæ of the lingual artery. Less important arteries are the ascending palatine from the facial, the ascending pharyngeal from the External Carotid artery and the descending palatine from the Internal Maxillary artery. The nearest large artery to the tonsil is the facial artery. The Internal Carotid artery is fully three-quarters of an inch distant from the tonsillar capsule.

The venous blood from the tonsil is returned into a venous plexus situated just external to the tonsil. This blood in turn goes into the pharyngeal plexus of veins, and hence into the Interior Jugular.

The nerve supply to the tonsil is not very free. A special tonsillar twig comes from the glosso-pharyngeal nerve, unites with the pharyngeal plexus, and from this the circulus tonsillaris is formed. This supplies the mucous membrane covering the tonsil, the adjacent part of the soft palate and the pillars of the fauces.

The lymphatics of the tonsil are very important. The efferents from the tonsil pass to the submaxillary group of glands. From there some lymph goes to the superficial lymph glands around the External Jugular vein, but the most of it goes to the deep lymphatic glands around the Internal Jugular vein. The lymphatics from the adenoid tissue in the nasopharynx go to the upper deep cervical set of glands. So in both cases the lymph eventually gets into the lymph glands along the Internal Jugular vein. If septic absorption then takes place from the tonsil, the glands at the angle of the jaw and down the neck soon become enlarged and tender to the touch. It has been demonstrated that if a sterilized emulsion of black pigment be injected into the tonsillar tissue, it can afterwards be traced into the lymphatic glands along the lateral wall of the pharynx, hyoid bone, larynx and along the deep vessels of the neck. It can be found in the bronchial and mediastinal glands.

Physiology:—No definite function has yet been satisfactorily proven for the tonsils and adenoid growths in the naso-pharynx. However, there are several facts in connection with their life-history that are very suggestive. The tonsils begin to develop during the fourth month of fœtal life, which would suggest that their function is not a very vital one. Tonsils and adenoids may be completely removed from a child three or four years old, and the system knows no harm. Even nature tends to remove this lymphoid tissue by a slow process of atrophy, beginning

about the end of the third year, and finishing about the age of puberty. So whatever their function may be it is confined to the first few years of life. The position of the tonsil is full of significance. Placed as it is at the entrance to the respiratory and digestive systems, it must be there for some reason. It is a well known fact that young children tend to put everything in their mouth that they get their hands on, and also that they have a total disregard for bad odors and poisonous gases. Nature then to protect the life of the young has placed a ring of lymphoid tissue at the entrance to the body to absorb poisonous gases and destroy harmful organisms. As the child grows older, intelligence increases, and so there is not the same necessity for this lymphoid tissue in the throat and so it disappears. The scientific world to-day is very much interested in immunity, and the tonsils have been investigated along this line. The tonsillar crypts have been likened to culture tubes, the mucus they contain to culture medium, and from their very position they are always exposed to many different kinds of bacteria. So by a biochemical process antibodies, etc., are produced and so immunity. Naturally it is in early life that immunity from different diseases is required. So after this function is fulfilled they disappear. Of course immunity is only a relative term. Why some people take many infective diseases and others do not we cannot say. This immunity theory makes a nice picture, but there is not sufficient proof yet to accept it.

Many other functions have been attributed to the tonsils. One, that they produce an internal secretion like ductless glands, another that they aid in salivary digestion. By others they are considered to be a great source of the leucocytes in the young.

Indications for the removal of tonsils.

(a) *Local Conditions*:—Occasionally, apparently healthy tonsils require to be removed only on account of their enormous size. Their presence interferes with respiration and deglutition to such an extent as to be a serious hindrance to health, and even life itself. I once saw a child of four years old brought to the Hospital cyanosed and in great respiratory distress. The only thing that was found wrong was enormously enlarged tonsils and adenoids. They were immediately removed, no anæsthetic being given. Within a very short time the child was a good color and quite happy. Often children with enlarged tonsils make a peculiar noise when eating; this is relieved by removing the tonsils.

Frequent attacks of tonsillitis are an indication of unhealthy tonsils. The crypts become filled with septic material and quinsy or some variety of tonsillitis occasionally develops. Diseased crypts keep up a chronic

inflammation of the tonsils as indicated by a continual aching pain in the throat, or an occasional sharp shooting pain up towards the ear. In these cases the breath is usually offensive.

The organisms usually found in diseased crypts are staphylococcus, streptococcus and occasionally the pneumococcus. Tubercular ulceration of the tonsillar tissue is very rare, and when present is usually associated with phthisis. Some authorities state that tubercle bacilli and giant cells can be demonstrated in from 4 to 10 per cent. of all tonsils removed.

(a) *Constitutional Conditions*:—The close relationship between tonsillitis, rheumatism, chorea and endocarditis has been well known for many years, but it is only recently that the close relation between rheumatism and arthritis has been proven to be associated with septic tonsils. This can best be demonstrated in young adults and people in middle life. They come complaining of considerable pain about the tonsils, offensive breath, and rheumatic pains all over the body, particularly in the larger joints, such as the knee and shoulder. On investigating the tonsils you find they are not large, but in the crypts is an offensive cheesy material, especially the crypts that open into the supratonsillar recess. These tonsils are inflamed and fibrous when probed. Completely remove these tonsils by enucleation and in a short time the patient will tell you that the rheumatism has disappeared. From this one sees that a diseased tonsil is a portal to systemic infection. On operating on such tonsils they must be entirely removed. Slicing off a piece of the tonsil with a guillotine is worse than useless, for by so doing you remove considerable normal epithelium and only a small portion of the tonsillar crypts which are the foci of infection.

The close relationship between tuberculosis and diseased tonsils has long been established. Frequently have I noted in strumous anæmic children with enlarged glands in their neck that their tonsils are large, soft and the crypts full of a caseous material. Undoubtedly the glands in the neck were infected by way of the tonsils. It is good practice to advise the removal of all diseased tonsils whether they are large or small, and particularly should this be done where there is a family tendency to tuberculosis.

Exanthemalous Fevers:—Children with enlarged tonsils and adenoids are very prone to contract scarlet fever and diphtheria, if they are exposed to the specific virus. It is reasonable to suppose that infection takes place through some fissure in the tonsillar epithelium. So the larger and the more diseased the tonsils are the more likely is this individual to take these infectious diseases if exposed to them; acute suppuration of the middle ear is almost sure to occur during the course of

these diseases if the child has enlarged tonsils and adenoids. Also the patient's chance of ultimate recovery from a bad attack of either scarlet fever or diphtheria is much lessened by the presence of enlarged tonsils and adenoids. The respiratory system is handicapped from the very beginning. So children who are likely to be exposed to infectious fevers should have their throats cleared out early.

Nocturnal Incontinence:—An increased amount of adenoid tissue has been associated with enuresis of children almost since the discovery of these post-nasal growths. It seems to be one of these things that text-books copy from one another. True, children troubled with nocturnal incontinence occasionally have adenoids, but the removal of these growths rarely, or I may say never, cures the enuresis.

It has lately been pointed out that thyroid extract in small doses is very effectual in curing this pernicious habit.

Ear Conditions:—No treatment for chronic suppuration of the middle ear is likely to effect a permanent cure if there are present in the case enlarged tonsils and adenoids. The pharyngeal orifice of the Eustachian tube is continually kept swollen and congested by the adjacent adenoid tissue. Even if there are enlarged tonsils and no adenoids, the enlarged tonsils push the posterior pillar of the fauces backwards and so up against the region of the Eustachian tube. This is particularly the case if the tonsils are imbedded.

Chronic middle ear catarrh is much relieved by the removal of enlarged tonsils and adenoids. This lessens the tendency to rhinitis and colds in the head and so lessens tubal congestion. Chronic otalgia is a symptom that many children with enlarged tonsils and adenoids complain of. It is nearly always relieved by clearing out the throat of the lymphoid tissue.

Children suffering from adenoids are mouth-breathers. They snore during sleep or at least breathe heavily. They have a chronic rhinitis with frequent acute exacerbations as evidenced by a copious watery nasal discharge. These patients are slightly deaf, but this symptom is marked when the patient has an acute cold in the head. The ear drums on examination are anæmic and indrawn.

To positively diagnose adenoid vegetations it is necessary to either see or feel them. It is usually impossible to see them under 6 years of age. However, over this age, by tactful management of the child, it can usually be accomplished, a post-nasal mirror being used. To make a digital examination, the patient should sit on a stool or low chair. The surgeon stands by the right side of the patient, and the nurse should hold the hands of the patient. The child is asked to open the mouth

widely and the left fore-finger of the surgeon presses the cheek, between the teeth. The right index finger is quickly passed in the mouth to the posterior pharyngeal wall and then up behind the soft palate. Feel first for the posterior border of the septum nasi, and the posterior choanæ, one on either side of it. Next pass the finger upwards, backwards and laterally. The amount of adenoid tissue can be estimated in this way. The fossæ of Rosenmüller should be explored at the same time. A little bleeding often follows the examination, and is in proportion to the amount of trauma used, and the amount of adenoid tissue present.

Neglected tonsils and adenoids produce very serious results. Examine a marked case in a child say about 12 years of age. It is a pitiable sight. The child that might have been mentally and physically well-developed has the appearance of an idiot. The child goes about with an open mouth, listless expression and is dull of hearing. The face is pale, long and narrow. On closer examination considerable facial deformity may be recognized. The upper alveolar arch is V-shaped instead of the normal U-shaped arch. The hard palate is high and narrow. When the mouth is closed the upper incisor teeth project in front of the lower ones about half an inch so that a finger might be placed between the teeth and not injured even when the molar teeth are tightly closed. Such a condition has been termed open-bite. Adults with enlarged tonsils usually have no adenoids. The chest presents a transverse constriction known as Harrison's sulcus, and the sternum is very prominent, producing what is known as pigeon-breast. These chest conditions are produced by nasal breathing during sleep, and are more marked when the tonsils are enlarged as well as the adenoid tissue in the naso-pharynx. At an early period in life the ribs are soft and pliable.

Operation.—Removal of tonsils and adenoids.

It is a difficult operation to do properly. The field of operation being so hidden from view, the laity are compelled to judge the thoroughness of the operation by the amount of blood produced. Occasionally a mother will venture an opinion that one tonsil is yet a little large or that the child still snores. The doctor dispels her fears by telling her the tonsil will soon disperse or the snoring now is only a habit and will soon go.

As the operation is not one of emergency, due preparation should be made for the anæsthetic, and for the sterilization of the instruments used. Probably no operation in surgery has so frequently ended in disaster as this one. The combination of anæsthetic and blood in the throat makes it so serious. The surgeon and the anæsthetist must both be very much on the alert during the short space of time of the operation. The pa-

tient's throat should always be inspected immediately before operation, and the temperature taken if you are suspicious of fever. Although you may have seen the child two or three days previously and arranged the operation for a fixed time, yet the child may have contracted diphtheria, scarlet fever or measles in the meantime. Make it the exception to operate if the temperature is over 99°.

Anæsthetic:—The patient should have a purgative the previous night. A child may have compound liquorice powder and an adult a cathartic pill containing a grain of calomel.

This is the operation par excellence where surgeon and anæsthetist should know how to work together. In no operation can the anæsthetist be more useful to the surgeon than this one. For this reason the surgeon always prefers to have the same anæsthetist. For the removal of adenoids alone, any anæsthetic that will produce anæsthesia for about one and a half minutes is all that is necessary. Gas or gas and oxygen does nicely, or chloroform and ether, equal part by weight. For the double operation, that is the removal of tonsils and adenoids, a much longer anæthesia is needed. I prefer a mixture of chloroform and ether, equal parts by weight. As ether by the open drop method is so safe, and produces no congestion of the veins of the head and neck, no doubt it will be used a great deal in the future. One disadvantage of it, is the length of time to produce anæsthesia. Whatever anæsthetic is selected, you obtain a considerably longer period of anæsthesia if you continue to keep the patient "under way" for three or four minutes before beginning the operation. Ethyl chloride for this operation is not good. It is unsafe, and also congests the veins of the head and neck. Although I have never seen a death with it, yet it often gives a good deal of trouble.

Local Anæsthetic:—Used chiefly for adults. By it tonsils can be removed with very little discomfort to the patient. However, if the patient is very nervous a general anaesthetic is preferred. I prefer to remove both tonsils at the same sitting. Frequent operations under local anæsthetics are not to be advised in nose and throat work.

Swab the tonsils, pillars of the fauces, soft palate and posterior pharyngeal wall with 20 per cent. cocaine solution. Warn the patient not to swallow any of the solution. A patient can stand a great deal of cocaine without any ill effects, if none is swallowed. The thorough cocainization of the pharynx and soft palate prevents the patient from coughing and retching during the operation.

Then inject with a special syringe 30 to 40 minims of a 1 per cent. solution of cocaine hydrochloride for each tonsil. Inject 10 minims under the mucous membrane in four different areas. These areas being

the middle of the anterior pillar, the upper part of the anterior pillar on a level with the base of the uvula, the middle of the posterior pillar and high up between the two pillars in the supratonsillar recess.

The same amount of a 3 per cent. solution of the lactate of cocaine may be used. It is less toxic, and also less effectual in relieving pain. A useful combination to inject is 30 minims of the following solution:—

T. Rx. Cocaine Mur.	40 grains.
Atropine Sulph.	1-3 grain.
Resorcin	1 drachm.
Glycerine	4 drachms.
Carbolic acid	5 grains.
Listerine	4 drachms.
Aqua Destillata ad..	8 ounces.

The Technique of the Operation.

Treat the tonsils the same as you would treat diseased lymphatic glands in other regions of the body, and when operating on them remove them entirely. The day for the tonsillotome is nearly over, except in special cases; I would not advise the use of the tonsillotome in a patient over 14 years of age. Slicing a piece off the tonsil is very bad practice. Every operator who has done many of these operations has his own fixed ideas about instruments to be used, and the position of the patient during the operation. Our aim should be to completely remove both tonsils and adenoids with the least possible danger to our patient. Anything that increases the length of the operation increases the danger. Too many instruments are a nuisance. After trying every possible variety of operation, I will now describe more or less in detail what I consider the best method in each particular case.

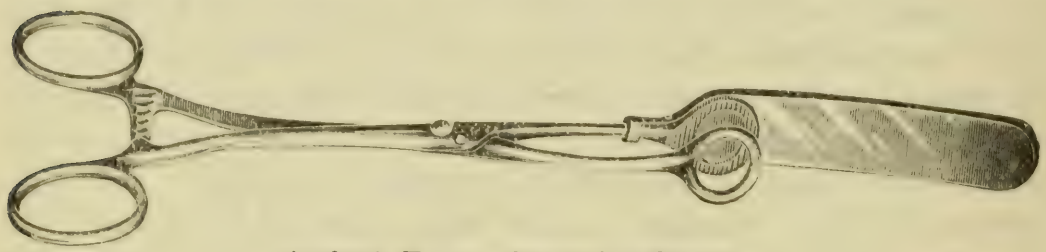
Operation for Adenoids Only:—Patient on the back and in a horizontal position. The instrument I like is a caged curette, St. Clair Thomson's modification of Delstanche's. They are made in four sizes, each a different width, and by selecting the proper width for different ages you are always able to just pass the orifices of the Eustachian tubes without injuring them. One sweep in the central line will remove the main mass of the adenoid tissue, and with the caged curette the growth is at the same time removed from the throat, and prevents its being swallowed or going down into the larynx. The patient should then be immediately turned on the right side to allow the blood to run out of the mouth, and now the operator should introduce his finger into the naso-pharynx. If adenoid tissue is left in the fossæ of Rosenmüller, it is easily removed by Lowenberg's bullet pointed forceps. Tieman, of New

York, makes a very nice-shaped one, with a curve that allows it to pass behind the palate. Any lateral curetting in the naso-pharynx is dangerous and unnecessary. By removing the central mass and what is in the fossæ of Rosenmüller the small amount of lymphoid tissue that is around the orifice of the Eustachian tube will atrophy on account of its blood supply being greatly reduced.

Removal of Tonsils and Adenoids:—The patient is under a general anæsthetic and in the horizontal position with the head slightly lower than the rest of the body. It is an advantage to have a small flat sand pillow under the shoulders. Now if the tonsils are prominent and the pillars of the fauces not adherent to the tonsils, I would remove the adenoids first, the patient being on the back, then immediately turn the patient on the right side and remove the tonsils by feel, using a Heath's (modified Mackenzie's) tonsillotome. The tonsils must be well pushed in by pressure behind the angle of the jaw by the anæsthetist. The lower tonsil should be removed first. With practise the tonsils can be completely removed in this way. Light anæsthesia is best, the cough reflex being retained. Testing the corneal reflex is of very little use in children.

The total length of the operation will vary from one to two minutes.

For Imbedded Tonsils:—The patient under anæsthetic and on the



Author's Tongue-depressing Forceps.

back, the head slightly on the side towards the operator, apply the tongue depressing forceps and give them to the anæsthetist to hold. Grasp the tonsil with a volsellum and pull it well towards the middle line. Then with a long dissecting forceps make an incision just external to the internal edge of the anterior pillar of the fauces, making the incision the whole length of the tonsil. Then by a little pressure made with the dissecting forceps, you find that you are beneath the tonsillar capsule and that the gland will shell out very readily. Now free the top and bottom of the tonsil a little, keeping outside the capsule. This freeing of the top and bottom makes a depression for the snare to engage in. Slip the loop of the snare over the volsellum and around the tonsil. Gently tighten the snare and the tonsil is removed completely with its capsule intact. As the loop of the snare is tightened it passes in the direction of the least resistance, and that is in the areolar space between the ton-

sillar capsule and the Superior Constrictor muscle of the pharynx. In this case remove the adenoids last. There is very little bleeding, as the severed arteries retract into the substance of the Superior Constrictor muscle. The total length of the operation varies from 5 to 10 minutes depending on how well the anæsthetic is taken. The cough reflex should be abolished.

For Flat or Sessile Tonsils:—This variety of tonsil is usually found in adolescence and in middle life. There is frequently a marked lingual prolongation, and if so it should also be removed. In this case, free the tonsil as in the previous type of case, and shell it out from top to bottom. A nice instrument for doing this is a blunt pointed scissors curved on the flat. In adults if the anterior pillar is widely attached to the tonsil by the plica triangularis, Leland's tonsillar knives are useful in freeing it. When you have the tonsil well freed down to the side of the tongue, sever the tonsillar tissue by the use of the snare. As in the previous case there is very little bleeding.

Local Anæsthetic:—The patient to be sitting up in a chair with a good head rest. Apply the anæsthetic as above recommended. Grasp the tonsil with a volsellum: pull it well inwards, and get beneath the capsule as stated in the previous cases. Sometimes in adults when local anæsthesia is used, it is less painful to free the tonsils from the anterior pillar by using special tonsillar knives.

After Treatment:—The patient in all cases should remain in bed for at least 24 hours, and a day or two longer if there has been much bleeding. The less fussing and spraying of the nose and throat the better. Ice to suck for the first two hours relieves the pain and tends to stop the bleeding. The food for the first 24 hours should be cold. Ice cream, custard, or cold bread and milk are all nourishing and easily swallowed. The second day, the temperature is frequently up a degree or two, but usually means nothing serious. Enquire for earache. Adults usually complain of a good deal of pain on swallowing after the removal of the tonsils. This may continue for 4 or 5 days. A purgative on the second day should be given. For children there is nothing better than castor oil.

Hæmorrhage:—(1) *Primary.*—Rarely does bleeding give much trouble under 14 years of age. The tonsils that bleed are the small fibrous ones of adults. Frequent inflammation has caused an undue amount of fibrous tissue, and the arterial walls are prevented from contracting as they normally would. In young adults you often see large red soft tonsils. These do not bleed much, as the original relative amounts of lymphoid and connective tissues are maintained. The use of the snare re-

duces bleeding to a minimum. After the operation is completed a careful examination of the throat should be made. If any adenoid tags are present remove them. They are usually indicated by persistent coughing. Sponge off the face and neck with a marine sponge out of ice-cold water. The cold tends to waken the child out of the anæsthetic and excites deep respiration, and so arrests the bleeding.

If the bleeding continues after the operation is over, make another careful examination of the throat and decide where the blood is coming from. (a) It may be a persistent capillary oozing. If so, apply pressure in the tonsillar sinus by means of a gauze sponge tightly rolled and held in place by a forcep. If necessary moisten the sponge in hydrogen peroxide. The bubbles that form seem to act mechanically in obstructing the capillary endings. Adrenalin chloride is of little use. It increases blood pressure and possibly increases the bleeding. It is an excellent drug to prevent bleeding, but is almost useless in stopping it. Secondary hæmorrhage often follows its use. If the hæmorrhage still continues take:

Mr. T. Mark Hovell's paste.	Tannic acid, 3 parts.
	Gallic acid, 1 part.

Mix these two powders. Then with a pestle and mortar make up a putty-like mass by adding a small quantity of water to a quantity of this powder. Now imbed the right index finger in this mass and rub it firmly over the bleeding tonsillar area. It usually stops the bleeding immediately, and as it can be quickly done it is not very disagreeable to the patient.

A patient who is bleeding, or has been bleeding, should be very carefully watched. The patient will not bleed to death by capillary oozing, except in hæmophilic cases. The hæmorrhage produces syncope with weakened heart's action, and so the bleeding stops. The patient must lie down head considerably higher than the rest of the body, and over nearly on the face with a suitable basin under the mouth. The patient must be specially warned not to swallow the blood. Often have I seen patients not spit out any blood, and the first indication that the nurse had that hæmorrhage was going on was when the patient vomited 2 to 3 pints of bright red blood.

If necessary to keep the patient quiet give, hypodermically, a good dose of morphia. Calcium lactate may be given per rectum, one drachm every 3 hours for 3 doses. If the volume of the pulse becomes very small an interstitial saline may be indicated, and in extreme cases saline intravenously. Normal saline enemata are also very useful.

For a Spurting Vessel:—Clear away all the blood and clots in the tonsillar sinus and pick up the bleeding point by a Mixter's artery forceps. Do not attempt to ligate the vessel for you will give the patient a great deal of unnecessary annoyance and in the end fail to get the ligature on the vessel. The forceps is not very uncomfortable in the mouth, and it may be removed in four hours. I have had over 25 cases of severe tonsillar hæmorrhage and they all recovered. The tonsillar clamp was never applied nor was the External Carotid tied. I think both these methods quite unnecessary.

Secondary Hæmorrhage:—Hæmorrhage after the first 24 hours is not common. When it does occur it is usually in adults who have had considerable primary hæmorrhage and where the primary hæmorrhage was arrested by the formation of a blood clot in the tonsillar sinus. The patient so reduced by the primary hæmorrhage does not stand the loss of blood well the following few days.

Case:—A girl aged 10 years, delicate and anæmic. Tonsils and adenoids were removed at 10 a.m. The tonsils were removed by a guillotine. There was considerable hæmorrhage at the time but it was soon arrested by the ordinary means. At 6 p.m. the child was allowed to leave the hospital and go home as there was no more bleeding, and the patient was in fair condition. After getting home the patient was put to bed and remained there the next day. During the second day, the child took considerable fluid nourishment. Early next morning, that is about 46 hours following the operation, the patient began spitting out some blood and shortly afterwards vomited up a large quantity of blood. A doctor was immediately sent for, but the child died before he arrived.

Acute Suppurative Middle Ear:—In hospital practice it occurs in about 1 per cent. of cases operated on. In 500 cases that I took notes of, it occurred 6 times. As far as could be ascertained, these cases had never any previous aural discharge. It is usually cured in a short time by suitable treatment.

In hospital practice doubtless a great many of the operation cases go to unsanitary homes. It is surprising that suppuration of the middle ear is not more common. Trauma to the Eustachian tube predisposes to it. Too much fingering in the naso-pharynx is not good. A lengthy operation increases the risk of blood getting up the Eustachian tube to the middle ear, and then suppuration is likely to follow.

Patients should be warned when blowing their nose not to obstruct both nostrils at the same time. In this way blood and purulent discharge is prevented from being forced up into the middle ear. Tags of adenoids

increase the discharge in the naso-pharynx, and if they become septic middle ear suppuration may follow.

Case: — A boy, age 7 years. Never had any previous aural discharge. Tonsils and adenoids removed. Earache followed on the 4th day, and aural discharge shortly afterwards. Streptococci found in the discharge. Child brought to the hospital on the 8th day following operation. An acute mastoid abscess was present, and was operated on immediately; perisinus abscess was also found. Lateral sinus was not thrombosed. Two days later child had a rigor and temperature went up to 106°. Wound opened up, sinus was now thrombosed. Internal Jugular vein was ligated in the neck. Child died on the 15th day after the removal of tonsils and adenoids. The cause of death was meningitis.

Septicæmia:—This is a very rare complication following the removal of tonsils and adenoids. Occasionally the temperature may go up to 101° and 102° and remain up for two or three days. This is due to septic absorption from the fresh wound in the throat. The lymphatic glands in the neck may become enlarged and tender. The best treatment is free purgation, liquor ferri perchloride internally, and a coarse hydrogen peroxide spray for the throat.

Too vigorous use of the adenoid curette low down on the pharynx wall may open up the retro-pharyngeal space. If so, sepsis may follow and give considerable trouble.

Case: — A man, age 23 years, had his adenoids removed by a caged curette. Retro-pharyngeal space was opened up on account of the patient jumping about during the operation. Gas was the anæsthetic. Five days afterwards the patient was admitted to the hospital with a very sore throat and temperature 103°. The next ten days his temperature was between 103° and 105°. He was treated by a cold pack and given polyvalent anti-streptococcus serum. Patient made a good recovery.

Pyæmia:—This is a very rare condition. Should acute otitis media and lateral sinus suppuration follow the removal of tonsils and adenoids, then it is easily seen how pyæmia might occur, but when there is not aural or lateral sinus trouble it is difficult to see how it could occur.

Case: — A child 8 years old. Very much enlarged tonsils and adenoids were removed. Child made an uneventful recovery until the 9th day following operation. There was never at any time aural discharge or enlarged or tender glands in the neck. The ninth day the child complained of pain in the right thigh, and in three days afterwards in the left thigh. There was phlebitis of both femoral veins, and an abscess was opened in each thigh. Five months afterwards there was another

abscess in the left arm. The case eventually made a good recovery. I am inclined to think it had no relation to the operation for the removal of tonsils and adenoids.

Probably no operation in surgery is so abused by the unskilful and also unnecessary removal of tonsils and adenoids. But when properly done and in suitable cases, the results are most satisfactory. The child's intellect, hearing and bodily welfare are preserved.

List of Instruments Used.

7½″ dissecting forceps.
Doyen's gag.
St. Clair Thomson's adenoid curette.
Heath's tonsillotome.
Farlow's snare.
Mixter's artery forceps.
Leland's tonsil knives.
Lowenberg's post nasal forceps.
Author's tongue depressing forceps.
Tilley's raspatory for tonsil resector.
Andrew's volsellum.

142 Carlton St., Toronto.

THE ACTION OF ARSENO-PHENYL-GLYCIN UPON *TRYPANOSOMA BRUCEI.*

BY

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I.

INTRODUCTION.

For two excellent reasons the practitioner in temperate climates must be interested in the experimental work which has been done on the treatment of the various diseases produced by trypanosomes.(1) The first of these reasons is that these researches have given him a third drug, to supplement mercury and potassium iodide in the treatment of syphilis. The second reason is, that during these researches some light has been thrown upon the method of action on the parasites of some of the trypanocides employed. As Ehrlich says,(2) through the continuation of studies such as these on the interdependence of chemical constitution and physiological, or therapeutic, action rational methods of treatment

may be developed and in the future, in prescribing, we shall "aim chemically" to affect that cause of disease we wish to destroy.(2)

During the first years of the search for an efficient trypanocide—a drug which would be as powerful in the treatment of trypanosomiasis as is quinine in the treatment of malaria—an enormous number of substances were tried. Some of them had a definite action upon the trypanosomes, but it was not until atoxyl was employed that the experimenters were able to definitely, and regularly, cure infections by pathogenic trypanosomes in laboratory animals.(3)

When it became known that syphilis, a disease in some of its symptoms almost identical with some forms of trypanosomiasis, was caused by a protozoan parasite not far removed from the trypanosomes, the idea suggested itself that atoxyl, which had a most powerful action on trypanosomes, might also be of value in the treatment of syphilis. It has been tried in syphilis, experimentally on apes and clinically on men, by several observers and it has become certain that atoxyl is distinctly valuable in the treatment of that disease.

The results obtained by the use of mercury and iodide are so constant that it is not suggested that treatment by them should be superseded by atoxyl; but it is maintained that atoxyl may be used with advantage in conjunction with these drugs and that there are cases refractory to, or with an idiosyncracy against, the ordinary drugs, which should be treated by atoxyl alone. To be successful, atoxyl must be properly administered. It must be given by injection, either beneath the skin, intramuscularly or intravenously; in the treatment of trypanosomiasis the latter is the best method. Since aqueous solutions of atoxyl deteriorate easily, the 15 per cent. solution of the drug to be employed must be freshly prepared and, in sterilizing, it should only be brought to 100°C. for two minutes. The dose should not be larger than 0.5 grammes of the drug. This dose may be repeated every five or six days and the treatment should be continued, probably, for some months. The patient should be watched carefully for signs of neuritis, especially if the dose mentioned is exceeded; neuritis and blindness have occurred in several cases of trypanosomiasis in which the drug was given too freely. It is interesting to note that antimonyl tartrate, which is also strongly trypanocidal, has been recently used in treating syphilis in negroes with considerable success.(4)

Atoxyl is the sodium salt of para-amido-phenyl-arsenic-acid.[1] It and

[1] "Atoxyl" is the trade name under which this compound was originally put on the market by a German firm. "Soamin" is the trade name of a compound of practically identical composition, which is prepared by Burroughs Wellcome & Co. It appears to be more constant and purer in composition than some of the samples of "atoxyl" which have been placed on the market recently.

its derivatives have been for some time the most efficacious drugs known for the treatment of trypanosomiasis; but they fail, not infrequently, to kill all the parasites in the animal treated and, consequently, recurrences of the disease are apt to occur after their use. Therefore, they do not afford a satisfactory means of treating diseases caused by trypanosomes.

Ehrlich, during his endeavours to ascertain the reason of the trypanocidal properties of various drugs used in the treatment of trypanosomiasis, came to the conclusion that a more reduced organic arsenical compound would have heightened trypanocidal properties; in *arseno-phenyl-glycin* he prepared such a substance.(5)

It is a yellowish powder, which must be prepared and kept *in vacuo* because it is so easily oxidisable. In his own laboratory Ehrlich found that this drug was more efficacious in the treatment of experimental trypanosomiasis in rats than any other substance with which he had worked previously.

Schilling,(6) Wendelstadt,(7) and Roehl,(8) in recently published papers have confirmed Ehrlich's statements by using arseno-phenyl-glycin in the treatment of the diseases produced by various trypanosomes in some laboratory animals.

The experiments reported in this paper were undertaken to determine the action of arseno-phenyl-glycin upon the disease produced in white rats by *Trypanosoma brucei*.

II.

Technique.

Trypanosoma brucei was chosen for use in these experiments because the disease produced by it runs an acute course; consequently, the result of observations on its experimental treatment can be obtained more quickly and with greater certainty than is possible with experiments made with parasites producing a more chronic disease. The strain of *Trypanosoma brucei* employed is one which has been maintained in small laboratory animals for some years. It is not a very virulent strain and only small quantities, one or two drops, of infected blood were injected in inoculating the rats; consequently, the disease produced was rather less acute than is ordinarily the case in rats infected by *Trypanosoma brucei*. It killed the six untreated control rats in from 8 to 14 days.

The existence of infection in the experimental animals was determined by examining microscopically, with a magnification of about 400 diameters, a fresh, unstained specimen of blood mounted between a slide and a coverslip.

The arseno-phenyl-glycin employed was sent to us by Ehrlich; we take this opportunity of thanking him for making it possible for us to perform these experiments. A freshly prepared 5 per cent. aqueous solution of the drug was always used and it was always given subcutaneously. Former work on the experimental treatment of trypanosomiasis makes it certain that the largest possible dose of the drug under trial should be employed. In order to determine the minimum lethal dose of arseno-phenyl-glycin, a number of rats were inoculated with varying doses of the solution of the drug, which were equivalent to from 0.1 grammes to 0.8 grammes *per* kilogramme of the body weight of the animal treated. Rats which received poisonous doses died within one to two days, according to the size of the dose received; none which lived for more than three days died from the effects of the drug.

It was found that a dose equivalent to 0.4 grammes, or more, of the drug *per* kilogramme of animal produced symptoms of poisoning in rats of 60 to 70 grammes weight; larger rats seemed to bear the drug better (one, weighing 104 grammes, survived a dose equivalent to 0.8 grammes *per* kilogramme of animal). The therapeutic dose for rats of about 70 grammes weight was fixed therefore at from 0.2 to 0.3 grammes *per* kilogramme of body weight of animal. In the paragraph which describes our observations whenever the amount of drug given is referred to, it is mentioned as the equivalent of so many grammes *per* kilogramme of body weight of the rat treated.

A trypanocidal drug, to be of any practical value, must be able to destroy the parasites in an animal already severely affected by them; for that reason the rats were not treated until they had been infected for some days and their blood contained considerable numbers of trypanosomes.

The treated rats were frequently examined until the parasites had disappeared from their blood. After the parasites had once disappeared, they were examined daily. If the trypanosomes recurred, the treatment was then repeated; in no instance was a second dose of the drug given unless the parasites had recurred.

As far as possible, rats of about the same size were used for all of the experiments. Most of the rats experimented with were young and small; consequently, those which survived the infection and treatment have grown and increased in weight rapidly.

III.

Observations.

1. Six rats (experiments IX, I, II, IV, XIX and XX) received a dose of 0.3 grammes after they had been infected for some days and while

their blood was crowded with trypanosomes. The number of the parasites diminished but they did not completely disappear from the blood of any of these animals; all died within 18 hours of the treatment and all died before the control rats which remained untreated.

2. Five rats (experiments X, G, XXIII, XXVIII, and GIII) received a dose of 0.2 grammes after they had been infected for some days and when their blood was crowded with trypanosomes. Although the parasites had disappeared from two rats and were diminished in the third, three of them died in from 12 hours to 4 days after the treatment and before the control rats which were untreated; two lived (experiments X and GIII), although the parasites recurred later in both.

3. Seven rats (experiments XIII, XVI, XVII, V, XIV, XXVI, and XXVII) received doses of 0.4, 0.3 or 0.2 grammes after they had been infected for some days, but while their blood contained small numbers of trypanosomes. The parasites immediately disappeared from the blood of six of them; in only one (experiment V) did they persist and cause the death of the rat. Trypanosomes reappeared after an interval in the blood of four of these rats,—experiments XIII, XIV, XVI and XVII. From the blood of the remaining rats—experiments XXVI and XXVII—the trypanosomes are still absent at (for experiments XXVI and XXVII) twenty-two weeks after receiving a single dose of the drug.

4. In six rats the parasites recurred; in experiment X in ten days; in GIII in four days; in XIV in two days; in XVI in one day; in XVII in two days, and in XIII after an interval of fifteen weeks after the first treatment. In every case, so soon as the recurrence of the parasites was perceived, an additional dose of from 0.2 to 0.4 grammes of the drug was given. The parasites were immediately driven from the blood of all of them; they have remained absent permanently from four of them. In two experiments, XVI and XVII, they have again recurred. In experiment XVII they have reappeared no less than five times at intervals of about ten days, although they have been immediately driven from the blood on each occasion by a dose of 0.3 grammes.

It has been known for some time that trypanosomes may acquire an immunity to any of the trypanocidal drugs: for example, if a trypanosome-infected rat is given insufficient doses of atoxyl, the trypanosomes will recur until, finally, they have become absolutely resistant to the drug and will survive the maximum dose which can be given to the animal without poisoning it. Strains resistant to *arseno-phenyl-glycin* can be produced in the same way, (8) and that is apparently what has occurred in experiment XVII.

The limits of the possibilities of atoxyl in the treatment of experimental trypanosomiasis are well known. It is rarely possible to cure

rats infected with *Trypanosoma brucei* by single doses of it. A fair number can be cured by thorough and repeated dosage. The rats treated by atoxyl as additional controls in this series of experiments did not survive. In animals treated by single doses of atoxyl the parasites reappeared and death followed. In one rat, weighing 70 grammes, which has received five doses of 0.5 ccm. of 5 per cent. solution of atoxyl, an atoxyl resistant strain of trypanosomes has been produced.

IV.

Summary.

Observations I and II show that doses of arseno-phenyl-glycin, large enough (0.3 grammes) to drive the trypanosomes from the blood at once, will hasten the death of heavily infected animals.

Only two of the rats, used in observation II, which received a dose of 0.2 grammes survived. The parasites later recurred in them; it is suggested that in these animals the trypanosomes probably were less completely destroyed than in those which died. Hence those which died may have died from a cause, such as the liberation of a cytotoxin, depending upon the destruction of the trypanosomes they had harboured. Similar observations have been made in the treatment of experimental trypanosomiasis by inorganic arsenic(9) and by antimony.(10)

Observation III shows that a proportion of early infections of rats by *Trypanosoma brucei* may be cured by a single dose of 0.2 grammes of arseno-phenyl-glycin.

Observations I, II and III taken together support the ground rules of the treatment of trypanosomiasis, that treatment should commence as soon as possible after the infection and that, despite the danger, the drug employed should be administered in full doses in order to minimise the danger of recurrences. If the parasites recur after the initial treatment, they, in a proportion of rats, may be permanently driven from the blood by repeating the initial dose.

By comparing the action of arseno-phenyl-glycin in these experiments with the results which may be obtained by the use of atoxyl, it is evident that arseno-phenyl-glycin is the more powerful trypanocide in the treatment of experimental infections of white rats by *trypanosoma brucei*.

EPITOME OF SUCCESSFUL EXPERIMENTS.

Experiment	*Type of Infection	Weight Initial	Weight Final	Date 1st treatment	Dose per kilo	Date recurrence	Dose	Remarks
X	+ + +	58	156	May 10	.2			No recurrence Nov. 24, 1909
XIV	+	75	117	May 11	.3			No recurrence "
				May 12	.2			
XXVI	+ +	72	96	June 10	.3			No recurrence "
XXVII	+ +	122	134	June 10	.4			No recurrence "
Giii	+ + + +	80	105	June 10	.2	July 14	.4	Single recurrence, 34 days
XVI	+ +	78	115	May 10	.2	Aug. 5	.2	" " 85 "
XIII	+	71	146	May 7	.2	Aug. 13	.2	2 recurrences, 98 and 110 days
						Aug. 25		
XVII	+ +	91	148	May 10	.3	June 5	3	4 recurrences
				May 12	.3	June 16	.3	No subsequent recurrence
						July 8	.3	Nov. 24, 1909
						July 20	.3	

*+Trypanosomes present. ++ Several in one field. +++ Many in one field. ++++ Crowded fields.

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THE MANAGEMENT OF NORMAL LABOUR.

BY

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First I desire to thank you most sincerely for your kind invitation to read a paper before you this afternoon.

Your request that I should discuss the "Management of Normal Labour" filled me with apprehension as to the success of my undertaking, for it is difficult to bring anything new before you in connection with this subject, while in the endeavour to make it interesting I may bore you with unnecessary detail.

Eutocia is defined as natural parturition, and is applied to labours which terminate without artificial aid and without injury to mother or child. Thus, strictly speaking, eutocia must be extremely rare, as injuries to the birth canal occur in a large proportion of women who are delivered of healthy children without artificial aid.

Ordinarily, normal labour means spontaneous delivery of a living child, which has presented in a vertex position, with the occiput rotating anteriorly.

Fortunately normal parturition takes place in an overwhelming proportion of cases. Sellheim states that normal labour occurs in 95 per cent. of all cases which come to term. This may be the case in Germany, but in this country the percentage of normal labours is not quite so high.

In this age of hurry and hustle, of ease and luxury, of chloroform and obstetric forceps, natural delivery is perhaps of not as frequent occurrence as nature originally intended.

To insure natural delivery, the pregnant woman should come under the physician's care early in pregnancy. This subject has been dealt with by my predecessors and I will not further enter into it.

In private practice, parturition should be conducted with the minimum disturbance of domestic routine. The essentials are privacy, absolute cleanliness of the patient and all that comes in contact with her, and no interference with nature's course. All these may be obtained with intelligence and foresight without entailing a serious strain on the family exchequer.

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To treat every case of normal labour with the same rigid technique that should attend a laparotomy is a mistake. Race suicide is encouraged by converting what should be an incident in life into an imposing, and frequently a *terrorizing,* function.

It is desirable to give the nurse and patient written or printed instructions as to what should be provided. In making out such lists only those things which are essential should be included, as it is undesirable to add to the expense of the outfit. Simplicity should be the aim and not elaborate luxury.

With regard to the physician's obstetric outfit, it bears not infrequently an inverse proportion to his skill and experience; the more imposing the former the more inadequate the latter, and *vice versa.* Suffice it to say that the obstetric bag should always be clean and orderly. It should be kept ready for emergent use, and among other things should contain a pelvimeter.

The obstetric forceps, in my opinion, should *never* be employed to terminate labour until the pelvis has been measured. Such a precaution would save hundreds of lives per annum.

The *labour room* should be amply provided with clean bed linen, and should be a large, quiet, well-ventilated room, and if possible, should be so situated as to insure that the patient will not overhear all the noise of the domestic machinery of the house.

I am in the habit of giving directions that the room to be occupied should be thoroughly house-cleaned a few days before the expected date of confinement.

The labour room should contain, besides a bed, one low table, two ordinary wooden chairs, a slop jar or pail, and an old rug or some protective paper, to keep the carpet from being soiled.

The situation of the bed is important. Care should be taken that it is not placed so that a direct draught will blow across the patient while she is sleeping or nursing, the reason being obvious.

The mattress should be firm and clean, and the spring of the bed should be so arranged that the patient's weight will not cause it to sag materially. If the bed is very low, wooden blocks should be prepared for placing under its feet. Only boiled water should be employed in the labour room.

I will not go into detail about the making of the labour bed, but will state that clean fresh linen should be employed and the objectionable habit of using old newspapers to be placed under the patient as a pad cannot be too strongly condemned. Very good non-absorbent pads may be made of unbleached cotton, padded with ordinary cotton batting, one yard

square and three inches thick. These pads may be sterilized by being placed in the dry heat of an oven for half an hour, or steamed in a boiler.

Preparation of the patient for labour.—It is of the utmost importance in the conduct of labour that the lower bowel should be thoroughly emptied, therefore I make it a rule that no matter how often the bowels have been said to be moved, the patient shall have an enema after the labour has set in. Another essential is the thorough cleansing of the vulva and thighs. Other things are desirable in the way of preparation, but these are essential.

If the patient has not had a hot bath within 24 hours of the onset of labour and her condition permits of it, she should be placed kneeling or standing in a bath and her whole body cleansed with soap and hot water. I do not like to have my patients in labour sit down in the ordinary household bath and prefer the above method as less likely to lead to infection of the genital canal.

After the bath the pubic hair should be trimmed if necessary, and these parts, as well as the abdomen and thighs, bathed in a 1/2000 solution of bichloride of mercury, or a 2 per cent. solution of lysol.

From this time on, the patient should wear an aseptic vulvar pad. Should the labour be prolonged the vulva should be bathed in one of these antiseptic solutions each time the pad is removed for any cause.

Preferably the patient should be in a freshly laundered night gown, over which she should wear a freshly washed wrapper and clean stockings and slippers. Her hair should be carefully combed, brushed and braided.

These preparations usually occupy, profitably, the early period of labour, and if after this toilet has been completed the pains are not occurring with too great frequency, she should be provided with some simple occupation, such as sorting linen, manicuring her nails, or some little duty that may be of help to the nurse.

All nervous and excitable relatives and friends should, if possible, be kept away from the patient who should be entirely under the control of quiet, businesslike attendants.

It will be noted that no mention has been made of a preliminary vaginal douche. Its employment is unnecessary, as it has been amply established that the vaginal secretions are sterile and even bactericidal in action and hence a douche will do more harm than good. In fact, while speaking of douches, I may state that it is rarely, if ever, necessary to give a vaginal or intrauterine douche before or after labour whether operative or not.

The antepartum examination of the pregnant woman should always include a careful measurement of her pelvic diameters. This routine may only be omitted in the case of women who have previously been delivered at term without difficulty.

The examination of the patient in labour should be directed towards ascertaining:—

1st. The general condition of the mother. This should include the state of her heart's action and her temperature.

2nd. The position occupied by the child and the relation of the presenting part to the inlet of the pelvis.

3rd. The condition of the fœtal heart.

4th. The character and frequency of the labour pains, these usually giving satisfactory evidence as to the progress in labour.

All this information can be obtained without entailing the risk of a vaginal examination. In modern obstetrics internal examination has been relegated to a very secondary position in making a diagnosis of the conditions present, as it is conceded that every such examination, no matter how carefully performed, exposes the patient to risk of infection.

In normal cases a vaginal examination is rarely necessary. The diagnosis of the presentation and position of the fœtus can be made by abdominal palpation, and information as to the condition of the cervix can readily be ascertained by a rectal examination, the physician's hand being protected by a rubber glove or special finger stall.

My attitude toward vaginal examination in labour is that it should never be employed unless information can be obtained by it which cannot be secured in any other way, and that it should never be undertaken without fully appreciating the risk involved and carefully protecting the patient from such risks, by every means in one's power.

In normal cases, information as to the condition of the os uteri is all that one desires to obtain by an internal examination. When really necessary this can always be obtained by means of a rectal examination, but in the general run of cases one can judge fairly well by the character of the pains and also of the vaginal discharge. It is only in cases of delay in advance of the presenting part, or when other signs fail that such an examination is really necessary.

In modern obstetric practice abdominal palpation is chiefly depended on for diagnosis of presentation and position. The more skilful one becomes in the art of palpation the less does one require to make a vaginal examination.

The most important point in palpation is to ascertain what part of the fœtus is presenting at the pelvic inlet, and what relation the presenting

part bears to the inlet. Having defined the part of the fœtus presenting, one then notes whether it is *at*, *in*, or *below* the brim, in other words, the extent of the engagement in the pelvis of the presenting part. One may then proceed to locate the position of the back, breech and limbs. The position and rhythm of the fœtal heart should then be noted.

If the presenting part is found not to be engaged in the brim, it is advisable to take the external measurements of the pelvis. Should the external conjugate diameter be found to be less than 20 c.m. (8 in.) then a vaginal examination should be undertaken to ascertain whether the promontory can be reached, and if so the diagonal conjugate should be measured.

Should any flattening of the pelvis be present then the future course of events depends on the degree of pelvic deformity, the mouldability and size of the fœtal head, and the vigour of the uterine contractions.

It should be borne in mind that even in the presence of moderate degrees of pelvic contraction, such as are not uncommonly encountered, at least four hours of second stage pains should be permitted before interference is undertaken.

Our experience at the Montreal Maternity bears out the statement of Williams, of Baltimore, that from 75 to 80 per cent. of all cases of contracted pelves deliver spontaneously.

It is in just such cases as these that much harm is done by unwise interference which is often attempted by hurried practitioners even before the end of the first stage of labour has been reached.

One frequently finds in consultation practice that attempts at delivery have been made before the completion of the first stage of labour. It is an obstetric crime to rely on the forceps to complete dilatation of the os uteri. These instruments should never be applied until the os has been completely dilated either by nature's efforts or by suitably adapted artificial means.

During the first stage of labour the character and frequency of the pains usually indicate fairly well the degree of progress that is being made. The patient should be encouraged to bear her sufferings with fortitude, but her strength should be conserved as much as possible and she should be restrained from efforts at "bearing down," as in this stage such effort has practically no value.

If she is restless and hysterical full doses of chloral (gr. xv.) at intervals of four hours, I have found of service in securing quietness between the pains, without markedly interfering either with the frequency or vigour of the uterine contractions.

In the first stage, liquid diet is in order, to sustain the strength and

vigour of the patient. Albumen water is my favourite, though a cup of hot freshly-brewed tea has undoubted sustaining and stimulating qualities which should not be ignored.

The onset of bearing down or expulsive efforts usually indicates the beginning of the second stage of labour. Usually the membranes rupture at this time. The pains are usually so severe that the patient takes to her bed. The onset of these symptoms indicates the reclining position.

Usually, shortly after the rupture of the membranes, the discharge from the vulva becomes distinctly mucoid, which in itself is a valuable sign of the descent of the presenting part of the fœtus.

When such signs are present, or when the head is known to be engaged well within the pelvis, vaginal examination is unnecessary.

When in spite of expulsive pains the membranes have not ruptured an internal examination is required. If the cervix is found completely dilated, and only when this is the case, the sac of waters has served its purpose and matters may be hastened by its artificial rupture. This cannot be accomplished as a rule by the finger when rubber gloves are worn. A sterilized artery forceps or any other suitable instrument may be employed for this purpose and I can recommend nothing better than a large safety pin, which I constantly use.

The descent of the presenting part may be recognized as it approaches the pelvic floor by applying the finger tips to the perineum at the side and a little in front of the anus, and pressing them firmly inward and upward during the acme of a pain. By this procedure the firm hard head can readily be felt through the tissues.

Preparations for delivery are then in order.

In a convenient position, so as to be readily reached by the physician, should be placed a small table. On it are placed a basin of warm antiseptic solution, preferably 1 per cent. lysol, or 1/2000 bichloride, a supply of sterile cotton or gauze swabs, a few sterile towels, sterile ligatures and scissors for the cord, and the sutures and instruments required for the repair of perineal lacerations.

The patient is then placed in position. I prefer the left lateral as being more comfortable both for physician and for the patient. It also renders her movements more easily controlled and leads to less exposure than is the case when the dorsal position is employed.

I usually employ a Kelly pad covered with a sterile towel. This drains into a suitable receptacle at the bedside, which also serves for the reception of soiled swabs, etc. The carpet at the bedside may be protected by several layers of paper or an old rug reversed.

The patient's clothing is rolled up and secured by safety pins so as

to protect it from becoming soiled if possible. She is covered by a sheet, and a light blanket if required.

The vulva is then carefully swabbed with pledgets of cotton wrung out of lysol solution, care being taken to always swab from the pubis towards the anus.

Then freshly-boiled rubber gloves are drawn over the physician's hands. The hands should be disinfected just as carefully as though the gloves were not to be worn.

I prefer to use gloves for I find that they not only afford better protection to the patient, but since I have employed them I have not had trouble with sore hands, from the irritation of prolonged immersion in antiseptic solutions. One soon becomes accustomed to them and the tactile sense is soon educated. I prefer a moderately heavy red rubber glove, as being more durable and in every way more satisfactory than the thin gloves.

Chloroform anæsthesia I employ in every case when there is time to use it. The patient's face is smeared with vaseline to protect her skin, and a dropper bottle and mask are given to the nurse or assistant who administers the chloroform under orders of the physician, so many drops with the onset of each pain.

The mask is only applied during the pains except at the moment of birth, when complete anæsthesia is desirable. I have never seen any bad effects from chloroform so administered, and am certain it never leads to the occurrence of post-partum hæmorrhage.

At intervals during the second stage of labour the fœtal heart rate should be taken. The rhythm should be noted during a pain as well as in the interval between. If the rate is very markedly reduced during a uterine contraction, or if at any time it falls to about one hundred beats per minute, delivery should be effected as rapidly as possible, in the interests of the child.

Protection of the perineum.—Laceration of the perineum cannot always be avoided in spite of the most skilful treatment. He who says he has delivered a thousand or even a hundred women without laceration of the perineum having taken place, is either blind or is a direct descendant of that Ananias of unsavoury fame.

The strain upon the perineum involves four factors at least, the size of the head and shoulders; the elasticity of the maternal tissues; the width of the pubic arch; and the rapidity of the expulsion, not to mention the skill and judgment of the officiating accoucheur. Given a narrow deep pubic arch, a child of average size with a firm head, in a primipara over thirty years of age, and you have all the factors for a fairly extensive laceration of the tissues of the pelvic floor.

Lack of knowledge of the mechanism of the escape of the head from the vulva, associated with excessive manipulation and haste on the part of the accoucheur, may be put down as contributive factors in perineal laceration.

Too early extension of the head, which is brought about by premature efforts at delivery, usually result in the perineum giving away. Throughout the whole of the perineal stage of labour the head should be in complete flexion, so that the sub-occipito-bregmatic diameter may distend the vulvar ring at the moment of the escape of the head. Once the parietal eminences have escaped from the ring of the vulva, the whole head slips forward under the pubic arch. Flexion is to be maintained until the parietal protuberances have thus escaped. Throughout the perineal stage the occiput is pressed forward against the pubic arch, and escape of the head can only occur when the occiput has completely cleared the inferior border of the pubis.

The physician's duty is to see that the normal mechanism of labour is not interfered with by undue expulsive efforts on the part of the patient at this stage, and that sufficient time is taken for the gradual dilatation of the soft parts.

With the patient in the left lateral position there is nothing to be done except exercise a masterly inactivity until the caput appears at the vulvar cleft. The patient may be encouraged to bear down, and a few whiffs of chloroform administered with each pain.

Fæcal matter or mucus escaping from the anus should be swabbed off immediately to prevent contamination of the field.

There is no necessity for supporting the perineum with the palm of the hand or with hot cloths. Far better leave it alone and simply observe what is taking place, and if the head is advancing with too great rapidity the patient should be told to cry out, so as to release the pressure of the abdominal muscles.

The idea prevails that the perineum should be supported by the physician making pressure upon it with the palm of his hand during the perineal stage of labour.

As a rule such pressure does more harm than good. The tissues of the perineum are thus compressed between the descending head and the physician's hand, and are thus more likely to be damaged than if left alone. If the head is coming down too rapidly, pressure may be applied directly to it, instead of through the perineum.

As soon as the caput appears the forefinger may be inserted under the pubic arch without actually introducing it within the vagina, and the posterior fontanelle and occipital protuberance located, the width of

the head estimated, and at the same time its relation to the pubic arch noted. Thus if the head is small and the pubic arch wide but very little strain will be thrown upon the perineum. On the other hand, if the head is large and well ossified, and the pubic arch narrow, or pointed, the result will be that greater stress will be thrown upon the perineum, and laceration much more likely to take place.

With each pain the physician may place one or two fingers just under the pubic arch, and promote flexion of the head, and at the same time feel whether the parietal eminences are coming well down towards the vulvar margin.

Throughout this period the perineum should be watched, and if it does not distend readily, it is far better at the acme of a pain to do a median episiotomy. Usually I slip one blade of a blunt pointed scissors, having a cutting edge of about 1½ inches, between the head and the distended perineum. The scissors are then turned and one snip made. If this cut is well timed the head usually escapes with the next pain, as its result is the relaxation of the resistance to the escape of the parietal eminences from under the pubic arch. At the moment of escape, pressure should be made between the tip of the coccyx and the anus so as to maintain the flexion of the head, and not as it is commonly supposed to produce extension. This manœuvre is best carried out with the left hand placed over the patient's thigh, controlling the escape of the head from the vulva, while the right hand guards the perineum as it slips back over the face of the child. Extension of the patient's limbs at the moment of the escape of the head affords a certain amount of relaxation of the perineal tissues, and I think assists in preventing any extension of lacerations.

In favour of episiotomy it may be said that one has a clean-cut wound, the surfaces of which are more readily approximated by a single suture than is the case in an ordinary laceration. In my own experience I have never regretted having made an incision such as described above, and I have frequently been very sorry indeed that I failed to resort to it.

Immediately the child's head has escaped, the mouth and nose should be swabbed off so that the mucus shall not be aspirated in case efforts at respiration are made. The finger is then run about the child's neck to ascertain whether the cord encircles it. If it is present, it must be pulled over the head or tied and cut, or loosened sufficiently to permit the escape of the child. Usually the shoulders come down in a moment or two, the anterior shoulder pivoting under the pubic arch while the posterior sweeps over the perineum.

During this manœuvre the child's head should be carried well up over the pubic region of the mother, so as to release the pressure of the shoulder

on the anterior margin of the perineum. This can usually be accomplished with the right hand supporting the child's head and shoulder, while the left assists with the expulsion of the child by making firm pressure upon the fundus through the abdominal wall.

Immediately the child is delivered, the patient should be placed in the dorsal position, otherwise contaminated discharges may find entrance to the distended passages. In the dorsal position the weight of the uterus and placenta is sufficient to compress and more or less close the patulous vagina, etc.

Considerable discussion has taken place as to whether the cord should be tied immediately after the birth, or delayed until all pulsation in it has ceased.

It has been demonstrated that when the tying of the cord is delayed the initial loss of weight in the first few days is less than in those cases in which the cord is tied immediately.

My rule is to tie the cord when I am ready to attend to it whether pulsation has ceased or not; except in the case of feeble, ill-nourished children to whom the loss of even a few centimeters of blood is an important matter. These I do not tie until the pulsations in the cord have ceased.

Repair of lacerations.—As soon as possible after the child has been removed it is my habit to carefully examine the vulva for lacerations. This should be done in a good light and does not necessarily entail much manipulation of the parts. If any lacerations are found they should be sutured at once. I prefer to do this while waiting for the placenta to become detached. An anæsthetic is not usually required for ordinary tears. I use a large curved needle and prefer silkworm gut as suture material. Silk sutures I have found unsatisfactory, as they become impregnated with lochial discharges and infection of the wound not infrequently results. Catgut has the same objection and besides it often absorbs too rapidly.

The needle should not be inserted too close to the edge of the wound and should be carried well down to the base.

One requires a short needle holder in order to get the best results, even if the patient's buttocks are supported on a bed pan as is my custom, otherwise it is difficult to place the sutures properly, unless the patient is turned so as to lie across the bed with the feet supported on chairs.

The sutures should not be tied till the placenta has been delivered.

A common mistake is to tie the perineal sutures too tightly. This causes them to cut into the tissues which tend to become œdematous after the sutures have been placed, besides making them difficult to remove.

Management of the third stage.—Experience teaches one that the old saying, "The more haste the less speed," is extremely apt when applied to the management of the third stage of labour.

Normally the placenta becomes separated from the uterine wall within twenty minutes to half an hour after the birth of the child, and slips into the lower segment of the uterus.

The separation of the placenta is usually indicated by a change in the position of the fundus. Immediately after delivery the fundus occupies a position half-way between the umbilicus and the symphysis. When the placenta has become separated from the uterine wall, the fundus rises to the level or even above the umbilicus.

There are three signs available to indicate that the placenta has separated from its site. First, the above described change in the position of the fundus; secondly, what is known as Winckel's sign; if the extended finger tips are applied to the abdominal wall immediately above the symphysis pubis and pressure is made downwards and backwards, the cord will be drawn into the vulva if the placenta is still within the uterus, while if this is not the case the cord will be extruded for a short distance. Again, if the placenta is still adherent to the uterus, compression of the fundus between the fingers and thumb will cause a fluid wave to be transmitted down the cord. This wave is very easily felt when the cord is lightly held between the two fingers of the other hand.

My rule is to wait till I have ascertained that the placenta has become detached before making any efforts to express it.

The fundus is lightly held through the abdominal wall, the fingers of one hand being placed behind it and the thumb in front. Should the organ relax it is gently massaged until it is felt to contract, but no pressure is applied. When the placenta has separated, pressure on the fundus in the axis of the pelvic inlet is sufficient to cause its expulsion.

If in half an hour the placenta is still adherent to the uterine wall, Crede's method of compression is resorted to in order to detach and expel it.

Crede's method consists in compressing the uterus between the fingers and thumb of one hand applied as previously described, while at the same time firm pressure is exerted downwards in the axis of the pelvic inlet, *just after a uterine contraction has reached its acme and is beginning to subside.*

The latter point is important, for pressure so applied to a relaxed and flabby uterus fails to accomplish the object of the manœuvre, and may lead to inversion of the uterus, and very serious consequences.

Premature efforts at expulsion of the placenta before it has become

detached, not infrequently lead to incomplete separation of the organ and favour retention of the unseparated portions, giving rise to a whole train of evil consequences, immediate and remote, which I will not enlarge upon.

Retained placenta is an extremely rare event when the third stage of labour is managed as I have described. It is one of the most infrequent complications of labour in our experience at the Montreal Maternity.

The administration of ergot in the third stage of labour in order to facilitate the expulsion of the placenta is condemned by all authorities. It tends to produce tetanic contractions and thus favours retention of the organ.

If portions of membranes are found to be retained, or fail to come away with the placenta, should they be manually removed?

This question I usually answer in the negative.

My practise is to leave them, unless their retention gives rise to hæmorrhage, in which case their removal by introducing the gloved hand within the uterus is necessary, and is often very difficult.

These retained membranes usually come away about the third or fourth day without trouble. Should they fail to come away at this time, and the discharges become foul, then a hot intrauterine douche usually effects their removal without difficulty.

TRANSTROCHANTERIC OSTEOTOMY.

BY

A. MACKENZIE FORBES.

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As the operations for the correction of deformities about the hip joint, known as transtrochanteric osteotomy, subtrochanteric osteotomy, or Gants' operation, are held somewhat in disrepute in this community I present this patient to-night.

The patient is now 22 years of age. He was treated for rheumatism in the knee for about three years, from the sixth year of his life; then the diagnosis of hip disease was made.

About a year after the diagnosis an abscess appeared in the region of the hip. This was opened. A sinus persisted for about three or four months. Then the patient was considered well.

The patient has been troubled with exacerbations of this disease, shown by abscess, at least every year, until the spring of 1908, with the excep-

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Presented at the Montreal Medico-Chirurgical Society, October 2nd, 1909.

tion of one intermission of two years, when he had no symptoms whatever outside of those attributable to the deformities which were due to this disease and which gradually appeared.

He was referred to me by Dr. Blackader in March, 1908. He was then suffering from a discharging sinus leading to a flexed, adducted and ankylosed hip. He was admitted to the hospital on March 12th, 1908, where he remained for one month. On his admittance the sinus was opened and swabbed out, perfect drainage being assured. The sinus healed in the hospital, where his hip was kept at rest by fixation. Patient was discharged on April 12th, with instructions to live a quiet life, in open air, and to return in the autumn of the same year for an operation to correct the deformities which were both flexion and adduction.

The patient was readmitted November 15th, 1908. He reported that he had obeyed instructions as regards life in the open air; that he had increased in weight, and that his general health had been good since his discharge from the hospital.

Examination demonstrated no sign of activity of the disease in the hip. There was, however, three inches of actual shortening and 30 degrees of flexion and slight adduction.

The patient being anaesthetized, a transtrochanteric osteotomy was performed and the deformity corrected, patient's leg being slightly adducted and extended to a position of 10 degrees flexion. The patient was then placed in a plaster-of-Paris spica.

On December 15th, 1908, the plaster-of-Paris spica was cut down and the patient examined. The correction of the deformity was then perfected under ether anaesthesia and a new plaster-of-Paris bandage applied.

On December 31st, 1908, the patient was discharged with no sign of active disease and no deformity about the hip, although there was an actual shortening of between two and three inches, which was easily disguised by such a boot as he now wears.

The patient was asked to wear a Thomas hip splint for a few weeks. He returned to me October 1st, 1909. Examination demonstrated the above mentioned actual shortening, compensated for, however, as before. The flexion allowed, about 10 degrees, was demonstrable. The patient walked with an almost imperceptible limp. He says that he feels well and has been well, and is now on his way to the Northwest Territories, where he feels able to do a man's work.

COCCYODNIA.

BY

A. Lapthorn Smith, M.D.

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Very interesting are these cases of pain at the very end of the spine. Although the writer has only recognized seventeen and operated on fourteen cases out of a total of fifteen thousand patients of whom he has records, he feels convinced that many others passed through his hands without his having noticed them. As he has not seen a paper on this subject in the medical journals for several years, it might be well to have our attention called to this very painful affection.

The earliest recorded case appears in the diary of Professor Smetius of the University of Heidelberg, who under date of October 27, 1588, made the following entry: "My wife has fallen backwards and so injured the coccygeal bone that she cannot sit without great pain, nor can she empty the bowels or bladder or cough without much distress."

In 1859 Professor Sir James Y. Simpson, who coined the name coccyodynia, while lecturing on this subject in Edinburgh, said that within three weeks he had seen at least ten cases of the malady in public and private consultation practice. For fear that his audience might think that he was exaggerating a little he explained: "When you have been made aware of the possibility of the occurrence of the complaint and when you have begun to look out for it, it is by no means very rare. Diseases like other subjects in nature sometimes seem rare, not because they are so in reality, but because our attention has not happened to be fully called to the recognition of them as they pass before our eyes. Of course it is a very unusual circumstance to meet with so many in so short a time; but it is not more wonderful than what often enough occurs in the experience of all surgeons in extensive practice, who find that during a short space of time they may have a succession of cases all presenting the same form of injury, as an epidemic, as it were, of fractures and dislocations, and that a long period may elapse before they again meet with a similar case." He adds that, while he had seen and recognized a great many of these cases, he had probably seen many others, also, the true nature of which he did not at the time understand.

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The writer of this paper could give another familiar instance of the same thing by pointing out that nobody had seen or even suspected a case of tubal pregnancy in Montreal up to twenty-five or thirty years ago. But by the attention of the profession being called to this most serious disease no less than fifty operated cases have fallen to the writer's share, with perhaps as many more to each of the other half dozen abdominal surgeons in this city. These cases were just as frequent fifty years ago, but they were neither suspected nor operated on, and their deaths were registered as deaths from heart disease or acute indigestion.

Although I have mentioned most if not all my fourteen cases of removal of the coccyx during the course of my clinical reports, I have never written a paper specially on this subject, and as the condition is a most distressing one, I believe that it would well repay us to make ourselves so familiar with its symptoms that we would not fail to detect it when it confronts us.

Symptoms.—Pain in the region of the coccyx whenever the patient sits down or rises, and sometimes even when she remains in the sitting posture. Most of the patients affected with it are obliged to sit on one hip or with only one side resting on the edge of a chair, or with the weight partially supported by a hand on the chair, and they are rendered very awkward and miserable in consequence. Some of them actually dread sitting down, so great is the pain then felt, while it is just as painful to get up or change their position. Some suffer most pain when walking, while others feel it worst during defecation or urination. In a word, whenever the muscles attached to the coccyx contract and pull upon it or when the little bone is pulled or pushed by the finger or is moved in any other way the patient suffers. Most patients suffer worse in winter or damp weather, so that they have been known to pass the whole winter in bed in order to lessen the pain.

Diagnosis.—If we would never fail to diagnose this condition then we must spend a few seconds in examining the coccyx whenever we examine a woman for pain in the lower part of the body. When we already have the first finger in the vagina it will literally not take longer than ten seconds to apply the other forefinger to the little bone from the outside, and move it backwards and forwards a few times. If there is anything wrong with the coccyx the woman will quickly cry out; in a bad case she will scream with the pain.

There is never any difficulty about feeling the bone even in the stoutest women. If it can be pressed upon or moved there is no coccyodynia. One reason why the condition so often escapes our notice is that patients are sometimes very indefinite in their description of their symp-

toms. Perhaps also through modesty they will complain of a pain in the back instead of saying that they have a pain at the very end of their spine, which would at once direct our attention to the real seat of the trouble. A few questions, however, as to what makes the pain worse will evoke an answer that any and all movements about the perineum aggravate it. If the patient is rheumatic, as she often is in these cases, she may very truly mislead us, so to speak, by saying that she has pains all over; while the very fact that a woman has been suffering for months or years and perhaps taking drugs for it would bring about a neuralgic condition of every nerve in the body.

Causation.—From the above symptoms it is evident that the trouble is located in the sacro-coccygeal articulation. Although the condition was for a long time considered as a neuralgia of the nerves of the coccyx, it would seem more likely, as it is generally recognized to-day, to be a rheumatic affection of the above joint. Many patients have attributed the beginning of their suffering to having sat on damp, cold ground, which in a person whose blood is saturated with uric acid, might well be a determining cause. But by far the greater number of cases of coccyodynia are due to an injury to the joint either by a fall on the back of a chair, the corner of a table, or even on the floor in such a way as to strike the end of the spine. Indeed there are cases on record where the bone has been put completely out of joint, causing such pain as to make the patient swoon.

Next to violence from without the most frequent cause is violence from within during parturition. In every case of labour the coccyx bends backwards so as to enlarge the pelvic outlet, but when the child's head is very big or when the pubic arch is narrow the head may then push the coccyx so far backwards that the anterior ligaments which bind the bone to the sacrum may be torn. Then one of two things happens: either the injury is cured by anchylosis, in which case there is no more trouble until the next delivery, when instead of dislocation there may be an actual fracture of the coccyx; or else there may be mobility, but with an inflamed joint, causing pain whenever the *gluteus maximus* or any other muscle attached to it contracts.

Treatment.—Until fifty years ago the only treatment was medicinal, and the patients received anti-neuralgic remedies, including morphine, until their general health was broken down and they had lost all hope of ever getting relief. Then its rheumatic nature was recognized and quite a number were relieved and a few cured by treatment directed against the rheumatic or uric acid diathesis. It would be amusing were it not so sad to read of all the things they used to do to one of these

sufferers, blistering, leeches, acupuncture needles and hypodermic injections of morphine. One successful case is reported of a very prominent old gentleman of his time, three hundred years ago, who, while going down the front steps, slipped on the ice and fell, striking his coccyx on the stone. He suffered great pain, but what troubled him most was that he could get no movement of the bowels. For this he was given aperients without avail, and by the fifth day his condition was serious. He was then advised that perhaps his spine was injured and that he should allow himself to be rolled and pushed and tumbled about as he lay on a wooden bed by two robust people. In the words of the chronicler "this was followed by the happiest results, for by the jostling the end of the os coccyx, which was bent inwards, was restored to its situation, and the obstruction being removed the bowels were moved *cum impetu summo*. It must be admitted that if the condition were not neuralgic at first it soon became so, because if the accident happened to a person in perfect health the pain and the treatment of the pain with long continued doses of morphine could hardly fail to bring about a general neuralgic condition. They made the mistake in those days of thinking that the pain was due to neuralgia, instead of the neuralgia being due to the pain and the treatment.

It was only about fifty years ago that an effective treatment was found by Dr. Nott, who first severed the muscular and fibrous attachments to the coccyx, leaving the bone in place, but at rest. This was done subcutaneously with a tenotomy knife and without an anesthetic, and generally gave relief for a time at least. It gave such relief from a pain which was so severe that on one occasion when Sir James Y. Simpson was performing it on a lady from India, who had long suffered from coccyodynia and at last made the long journey to Edinburgh to seek a cure, an accident happened. I will let Sir James tell it in his own words. "I was dividing the last fibres of the coccygeal attachments when the slender knife gave way, and broke among the dense structures. I told the patient of it and she at once raised herself up in alarm to hear of the calamity, but before I had done telling her of what had happened she had had time in sitting up to discover that she had been cured of her disease and rejoiced at the discovery. She quickly replied, 'Oh, never mind, the pain is gone, let the knife remain.' And there, for aught I know, it remains to this day." Not only this one remained permanently cured but he reports several others, one "a lady who had been a martyr to it for twelve years past and who night and day used to suffer great pain whenever she made any movements of the body. Yet in her case isolation of the coccyx in the manner above described produced im-

mediate relief, and ever since the operation was performed, a fortnight ago, she has been perfectly free from pain."

Later on both Dr. Nott and Sir James Y. Simpson found that the pain returned as the muscles and ligaments became reunited to the bone. They then adopted the plan which we use to-day, namely, the complete removal of the bone at its articulation with the sacrum, which is the only treatment which gives a sure and lasting result. At least my own experience of removing the coccyx has been most satisfactory and the patients on whom I have performed this little operation have been the most grateful ones I have had, much more so, indeed, than those whose lives were saved by an early operation for cancer of the breast or uterus. I am at a loss to understand how the experience of a few operators could have been otherwise. Skeene reports two cases where the patients suffered a great deal for several months after the operation. On looking closely into his description one may perhaps find the reason; for he not only removed the coccyx but a considerable portion of the sacrum also. This I have never done nor can I see any object in doing anything more than to discover the coccyx at its articulation with the sacrum.

The operation.—A straight incision is made two inches long over the centre of the coccyx down to the periosteum; the skin is dissected back and held by retractors, while the knife is passed down one side of the little bone and up the other so as to sever completely the attachment of the gluteus maximus, coccygeus and levator ani of both sides, and of the sphincter ani in the middle. Then the bone is pressed sharply forward so as to put the interspinous ligament on the stretch, when it is easily divided and the joint opened. Then the rest of the ligaments holding it to the sacrum are cut, and there only then remains the fascia between it and the rectum. This is cut with scissors and the bone is lifted out with a light pair of bone forceps. Sometimes we get into the joint below the sacro-coccygeal one, in which case we have only to feel if there is a movable piece of bone remaining, and if so it is easily removed. There is rarely much bleeding, but when there is there is no difficulty in stopping it, first by packing for a minute or two with a very hot gauze sponge, and then if any little vessel continues to spurt it is better to put on a fine catgut ligature. When all oozing has been stopped we pack the cavity rather firmly with a strip of mild iodoform gauze, which is not removed for several days. The skin incision is closed carefully with silk-worm gut and a light dressing put on, because owing to the situation it must be changed frequently. The end of the iodoform gauze drain is left hanging out at the top of the incision, which is the lowest point for drainage when the patient is on her back. Two or three

quarter-grain hypodermics may be given during the next day or two if there is much pain, although many patients have stated that the pain after the operation was very much less than it had been for months before. The temperature generally goes to 101 the first evening, 100 the second, and is normal the third.

For my fourteenth and last case I am indebted to Dr. Robert Wilson, whom the patient consulted at the out-door department of the Western Hospital on July 10th and was admitted to my ward on July 13th. Mrs. M., 22 years of age; married two years; no children; had a miscarriage two months after marriage, which she attributed to a fall on the ice and striking the end of her spine. This occurred two years ago and ever since she has been complaining of severe pains in the region of the coccyx when she sits down or gets up, and sometimes even when she remains in the sitting posture. Sometimes she could only sit on the edge of a chair, as the slightest pressure on the end of the coccyx caused severe pain. She also suffered especially at the end of the act of urination and defecation. At first when I questioned her I almost failed to recognize the true condition, for she said the pain was in her back, and on making a pelvic examination I found a retroverted and congested uterus which would be enough to explain a backache. But happening to press upon the coccyx she flinched so much that my attention was called to it, and I found that she was the subject of coccyodynia as well as of nervous symptoms due to the retroversion. As there was some endometritis, we began by doing dilatation and curetting, then Alexander's operation of shortening the round ligaments, after which we removed the coccyx. I am a firm believer in doing all that has to be done at one sitting. The strip of iodoform gauze was removed on the fourth day, the stitches on the tenth day, she got up on the eighteenth day and went home on the twenty-first. Her physician has since informed me that the result has been all that could be desired, as she has had no pain or discomfort of any kind.

Many years ago I had a lady under my care who has since passed out of my hands. This lady suffered agonizing pain, as she believed, in the lower part of the rectum, for which she had consulted many surgeons in England without either they or I having recognized the true nature of it. We all looked upon it as some form of neuralgia, but I feel certain that the removal of the coccyx would have cured her. This agonizing pain would awaken her in the night and would last from four to seven minutes, during which the perspiration would break out in drops on her forehead. I tried many quick anodynes, including nitrite of amyl pearls, but nothing short of chloroform would have acted quickly enough. It

was no use to send for a doctor at the time, for the attack would be over before he could get there. She was afraid to acquire the habit, and therefore declined to take chloroform herself. This patient was exceedingly rheumatic, frequently having to call in a throat specialist for rheumatism of the throat. In the light of my present experience I would explain these mysterious attacks as follows. A little gas accumulating in the rectum would set up a reflex contraction of the sphincter ani; this would pull on the coccyx and the pain thus caused would start a spasm in the levator ani and other muscles attached to it. If this patient should ever consult me again I will urge her to have her coccyx removed.

In view of the importance of making a diagnosis I would urge the systematic examination of the coccyx whenever we are making a pelvic examination or whenever the woman complains of pain in her back low down. If the coccyx is found to be painful further inquiry will generally elicit the history of a fall upon the end of the spine. In most of my cases this was the history given and the coccyx was pointing forwards at about a right angle to the sacrum. In a few of them there had been no history of a fall, but the trouble dated from a severe instrumental delivery which left it bent backwards. It is quite natural for the coccyx to bend a little backwards so as to give a little more opening at the pelvic outlet, and for this purpose it is generally admitted that the coccyx is more moveable in the female than in the male. This may be the reason why coccyodynia is of much greater frequency in women; men are just as liable to fall upon the end of their spine as women.

A CASE OF MYASTHENIA GRAVIS.

BY

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In presenting this patient before the Society I might first say that Myasthenia Gravis is a disease characterized by general feebleness of the muscles, and also by their quick exhaustion on use, and the quick renewal on rest of what power they possess.

This patient is one of special interest, as, some of you may remember, he was shown here by the late Dr. James Stewart seven years ago. Dr. Finley had shown a similar case in the previous year. At that time, seven years ago, the symptoms were well marked and typical. He had right-sided ptosis and diplopia. There was paralysis of outward move-

Read before the Montreal Medico-Chirurgical Society.

ment of the left eye and of upward movement of the right eye. He had difficulty in mastication and in swallowing, especially after he had been eating for a little time.

The upper extremities were weak and became exhausted easily. On asking him to raise his arms to the shoulder-level after about 40 or 50 attempts he could raise them no more. After walking the length of the ward his legs became exhausted and he developed toe drop. If he looked at the ceiling for about two minutes ptosis increased in the right eye and developed in the left eye. If allowed to rest a few minutes he could again carry out the movements. In the morning, after the night's rest, exhaustion did not take place so easily. Subjectively, the patient complained of aching pains in the muscles, especially after fatigue. There was no objective sensory disturbance.

The electrical reaction of the muscles was typical. If the muscle were brought into tetanic contraction with a faradic current it soon became exhausted and would no longer react to this current, while it continued to react normally to galvanism. In fact, in spite of treatment, the patient was apparently in a very bad way. He was advised to live in the country, which he did, and he states that for the past five years he has been without symptoms. A few months ago, following severe mental strain brought on by the death of his son, he has again developed ptosis of the left eyelid and paralysis of upward movement of that eye, and just within the last week he has also lost the power of outward movement in the same eye. His extremities when he returned to the clinic were perfectly strong, grasp registering 100 on our strongest manometer, and he did not become exhausted with exercise, but there has been a noticeable and slightly progressive weakness since then, although it has by no means reached the paretic stage yet. The electrical reactions of the muscles are quite normal, and the nervous system is otherwise unaffected. Reflexes are all present and normal.

With the patient's consent, Dr. Keenan kindly removed a small piece of the left deltoid muscle under local anaesthesia. It was put immediately into Zenker's fluid and stained with haemotoxylin and eosin, and as a whole stained well. But some bundles of fibres stained very poorly. This does not seem to be an artifact in the staining, as these poorly stained fibres can be followed through a whole series of sections. They are in many cases surrounded by well-stained muscle fibres. They almost invariably show a longitudinal splitting of the fibres. In some places only individual fibres show this lack of staining property. In other cases a whole bundle of fibres show the same failure.

Numerous muscle fibres show an appearance as if a vacuole or sharply-

defined area of light colour lay in the fibre. This circular or subcircular vacuole, if it be such, appears in successive serial sections and therefore appears to have its long axis coincident with the long axis of the fibre. These areas appear a light pink, rather than colourless, although in some cases there is a colourless ring surrounding this pinkish centre, which is in turn surrounded by the ring of well-stained muscle fibre. Again, many fibres are seen with simply a poorly-stained centre, the periphery being well stained.

In other places only a more or less irregular area of the transverse section of the fibres is well stained and looks fairly normal, while the rest of the fibre does not stain, and shows the longitudinal splitting mentioned above. This also can be followed in the same fibre through a series of sections. The nuclei of the muscle cells appear normal in numbers in all the fibres, and stain well.

There is nothing abnormal to remark on in the vessels, and there is no sign of the collections of lymph cells which Buzzard has described.

Of interest in this connection are some slides from the various organs in cases of Myasthenia, which have been prepared for me at the National Hospital, London, England, through the kindness of Dr. Buzzard and Dr. Holmes, showing what Dr. Buzzard has named "lymphorrhages" in the muscles and various organs. These are small exudations of lymph cells between the muscle fibres. One can see also a change in the contour of some of the fibres with atrophy, and also a diminution in the staining power in some of the fibres. These are, Buzzard has found, a constant feature in the disease. Others also have found these "lymphorrhages." Weigert was the first to describe them in 1901. He looked upon them as metastases of thymus gland tumour, and while they may have been so in his case they certainly are present where no such tumour is present in the thymus or elsewhere. Buzzard has found in his eleven cases that frequently there is a persistence of the thymus gland.

Kaufmann found excess of lactic acid in the blood and urine and looked upon it as a fatigue product.

I am indebted to Dr. Bruere for the following exhaustive report on his examination of the urine, which he undertook while the patient was in the hospital.

Date	Amt. of urine in 24 hours	Total acidity	Total N.	Ammonia N.	Urea N.	Uric acid N.	P_2O_5
18/6/09	1460 c.c.	405.88 $\frac{n}{10}$ NaHO	11.262	0.662	9.292	0.193	1.788
19/6/09	1165 c.c.	274.94 $\frac{n}{10}$ NaHO	10.487	0.433	8.944	0.153	1.409
20/6/09	1626 c.c.	465.03 $\frac{n}{10}$ NaHO	14.113	0.646	11.987	0.227	2.154

Not a trace of lactic acid could be found in 4000 c.c. of urine examined. The samples of urine were albumin-free and glucose-free. The nitrogen distribution was also normal throughout.

Knoblach's theory is ingenious. He points out that in many of the cases reported the muscles are stated as having a pale appearance and compares them to the white muscles one finds in chickens and rabbits, etc. As he says, they have a different physiological action from the red muscles. They react more quickly but cannot sustain an action as long. They initiate a movement, the red muscles carry it on. The white muscle produces more lactic acid and fatigues more readily.

It is probable, as Buzzard points out, that the symptoms of the disease are best explained by assuming the presence of some toxic, possibly autotoxic, agent, which has a special influence on the protoplasmic constituent of voluntary muscle.

For treatment, it seems to me, katabolic changes in the muscles should be lessened as much as possible, by rest, and deficient elimination of waste products increased by massage, oxygen inhalations, and so on.

INSANITY IN IMMIGRANTS.

BY

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The charge having been made in some quarters that there was an unduly large number of immigrants being admitted to Canada, who became subsequently or were at the time of admission insane, it became a duty to endeavour to determine, as far as statistics were possible, what the exact situation was.

For comparison, it was necessary that comparisons of populations be made as regards age-periods, sex, nationality, etc., according to the last census. The population by age-periods was:—

	England and Wales 1901		Canada		United States	
Under 15	32.4		34.0		34.4	
15—24	19.5		20.0		19.6	
25—34	16.1	47.8	14.5	43.6	15.9	47.6
35—44	12.2		9.1		12.1	
45—54	8.9		11.5		8.4	
55—64	6.0	19.5	8.2	25.3	5.3	17.7
65	4.6		5.6		4.0	

The notable difference at different age-periods in Canada, especially as compared with either England or the United States, points to the fact that if a small population, as a Canadian Province or Eastern State, lost during a 10-year period a notable number of its young population, or on

the other hand had added to it an abnormal number, it must be apparent that the proportion of persons normally present in any age-period would be notably altered. The first is the explanation of the excessive number of persons in the three later age-periods in 1901 in Canada, which had for 20 years been losing to the United States a notable number of young men and women, while, as will be seen in the figures for the three new Western Provinces, made up of a young population, the difference in the age-periods in the 1906 census, by an enormous immigration of nearly 100 per cent. over 1901, makes the variation from the normal even more marked. Thus:—

Age period	Canada 1901		Manitoba Sask. Alta. 1901		Manitoba Sask. Alta. 1906	
0—15	34.0		38.4		34.3	
15—24	20.0		19.2		21.4	
25—34	14.5	43.6	15.9	47.2	19.0	52.2
35—44	9.1		12.1		12.0	
45—54	11.5		7.0		7.3	
55—64	8.2	15.3	3.7	14.0	3.7	13.1
Over 65	5.6		2.3		2.0	

The causes of these differences are at once apparent if we note the number of children in an immigrant population. Taking the years 1905-6-7-8, it is found that of the 187,519 American immigrants to Western Canada, there were: men, 106,040; women, 40,359; children, 41,090, or an average of 21.91 per cent. of children of 14 years and under, as compared with, in a normal population, 34 per cent. This variation is even more marked in the immigration from Europe, etc., to the United States, which was, for 1904-1908, but 12.1 per cent. in a total of over 4,000,000.

Having these primary facts before me it became essential that in any study of insanity in a given population the number of immigrants in each age-period be carefully compared with its relative population, and as up to the end of 1908 the total immigration returns to Canada were available, I attempted to study the effect of this immigration to the three Northwest Provinces of Canada, whose population had increased by almost 150 per cent. between 1900 and December, 1908.

It was especially difficult to determine the true population of Canadians and Americans in these provinces, because a very notable proportion of the immigrants had been from Eastern Canada, and of those from the United States many were returned in the census of 1906 as "returned" Canadians, although in the immigration returns many were given as Americans. Estimate had also to be made of the natural increase in the population of 1901 and of the immigrants of each successive year.

With the errors so far as possible eliminated in estimating population by nationalities, I was fortunate in being able to obtain a yearly return of the admissions into the several insane asylums from 1901 to 1908.

ADMISSIONS TO ASYLUMS IN MANITOBA, SASKATCHEWAN AND ALBERTA, 1900-1908

	Canadian	Eng.	Irish	Scotch	U. States	Ger.	France
Total for 9 years	759	353	80	106	149	56	53
Total of 1st 5 years	362	146	29	53	42	23	24
Total of 2nd 4 years	397	207	51	53	107	33	29

	British Possess.	Norway & Sweden	Austria	Russia	Italy	China and Japan	Unkn.	Total
Total for 9 years	13	133	145	95	3	6	31	1982
Total of 1st 5 years	4	54	55	43	1	1	4	840
Total of 2nd 4 years	9	79	90	52	2	5	27	1142

Comparing the admissions at the end of 1900 with those at the end of December, 1908, the fact is found that in one of the two asylums 40 per cent. of those present in 1900 were still inmates in 1908, and in the other 61 per cent., indicating not only the probably young age at which such were admitted, but also how, without any per 1,000 increase of insane, asylums do rapidly fill up. That is, with a total of 407 in the asylums in 1900 there were, including these, to the end of 1908, 1,982 admissions; but with a population increased by 150 per cent. in 1908, as compared with that in 1900, the admissions were 358, as compared with 142, as estimated per thousand population admissions in 1908 were .335, while those admitted in 1901 were .339 per 1,000.

It is of importance as regards the number of immigrant insane that the Canadians in the population of 1901 were 62 per cent. of the total population and in 1908 but 54. If a larger group be taken, as the first five years compared with the latter four years, which, with a population of just 1-7th more persons had 1,142 admissions as compared with 840 or with 961 if the population be made of the same ratio, it appears that there is a slight increase; but it will be observed that the movement of a portion of the 38 per cent. of the total population from below the 15 year age-period to that between 15 and 24, which was 8 per cent. of the total admissions in any year, and of those between 50 and 60 to the period beyond that, will fairly account for this increase. If we turn to the rate per 1,000 of admissions of different nationalities for the nine

years, and reduce them to an average for one year, we obtain the following:—

Nationality	Population	Admission per 1,000 to N.W. asylums; average of 9 years reduced to 1 year
Canadians	461,229	0.19
British Islands	185,401	0.32
British Possessions (total 1,533)	1,533	0.94
United States	218,347	0.076
Germany and Holland	18,132	0.34
France, Belgium and Switzerland	28,711	0.52
Austro-Hungary, Galicia, etc.	85,091	0.18
Russia and Finland	47,206	0.22
Italy and Spain	2,134	0.16
China and Japan	1,464	0.45
Others	1,497	2.30

What is worthy of remark in these tables is the relatively low rate of native Canadians and of Americans; but it must be remembered that of the latter probably a larger percentage are of Americanized-Germans, Scandinavians and their families than of the old Anglo-Saxon stock.

However, it has been remarked by others as well as myself that the Teutonic peoples, both German and Scandinavian, have in America a relatively high number of insane. What further is equally notable is that the Slav races, whether native Russians or Galicians, Poles, etc., have year in and year out a remarkably low percentage of insane, and the same may be said especially of the Italians.

Another rather remarkable fact is shown by the tables, viz., that of 1,982 admissions 1,274 were men and 708 were women. Compared with the ratio per capita it is found that while males to females in the population was:—

Census	Males	Females
1901	54.6%	45.4%
1906	57.6%	42.4%
The ratio of admissions was—		
1901	64%	36%
1906	66%	34%

The idea that life on the wide western prairies is especially fatal to the healthy mentality of women seems absolutely without foundation, and is, I trust, permanently exploded.

To make our tables yet more valuable I may give the ratio per 1,000

of admissions to the Northwest asylums, averaged to a rate per 1,000 population for one year:—

Age periods	Ratio per 1000 population at each age period
15—24	0.11
25—34	0.52
35—44	0.66
45—54	0.72
55—64	0.70
65 and over	1.05

The comparison of the percentage of admissions as compared with the percentage of population for the same period to the total is of much interest. For 1901-1906 the admissions between 25 and 44 were 58 per cent. of the total, compared with 44.2 per cent. for the same period in English asylums. For the period over 44 the percentage is 33 per cent. of the total, as compared with 39.8 for English asylums.

If we take the population percentage for the same age-periods, 25 to 44, we find in the Northwest Provinces it was 31 per cent. of the total as compared with 28.3 in England.

What, however, is very remarkable is that while in the Northwest Provinces the percentage of admissions between 15-24 was but 7 per cent. of the total, while the population was 21.4 of the total in 1906, the admissions in England were 13.4 per cent., although the population was but 19.4 per cent. of the total over 15 years. It would appear that the mental breakdowns in England were greater in the early period of life, and thus would reduce somewhat the number of insane.

In the period between 25 and 44 the figures for New York State show a similar rate to that of England. Assuming the great difference to be real and not accidental is it to be explained by the great difference in the proportion of urban to rural population in the two latter cases? These comparisons have an important bearing upon the total insane in any population, since while a high percentage, if under 15 years, tends to lessen the total admissions over a low percentage of population in this period, and a relatively high population in the years beyond 45 years tends to increase the total admissions, yet it is the population in the years 25-45 of stress, wage-earning and child-bearing which tells most directly in the total admissions.

As we have already seen, the percentage of the total population in England between 25-44 was nearly 5 per cent. greater than in Canada in 1901, but is almost exactly the same as in the United States in 1900. Hence it will be of interest to compare the rate per 1,000 of admissions in the three countries.

The following table taking New York State figures is illustrative:—

Average yearly admissions to asylums in different countries by age periods and rate per 1,000 population for each period.

N.W. Canadian Provinces 1900 to 1908 (average)		England 1902 to 1907 (average)	New York State 1904
Under 15	—	0.03	0.006
15—24	0.11	0.46	0.7
25—34	0.52	0.93	1.2
35—44	0.66	1.22	1.49
45—54	0.72	1.37	1.80
55—64	0.70	1.36	2.00
65 and over	1.05	1.53	2.80
Unknown age	—	—	6.00

Owing to the age-periods from which the figures of the 1901 census for all Canada are given they are not exactly comparable with the above, but the total insane were 3.07 per 1,000.

Accepting the figures for England as a standard we find that five, or one in 2,000 population, were admitted in a year to asylums there. If the population for New York for 1900 be taken for a divisor then the admissions, taking these for 1904, were 0.91 per 1,000 annually, but if we take the population increase of New York cities for the four years as it was given for 1904, at 10 per cent., then we reduce this to 0.80 per 1,000.

The admissions for the Northwest Provinces with their 150 per cent. increase, chiefly through immigration, reduced to an average, give 0.27 per 1,000, or about one-third those of New York and one-half those of England.

To illustrate how much care must be taken in comparisons, the following table is given of the official insane in different countries:—

Country	Year	No. per 1,000 in asylums	Class included
England	1903	3.40	All notified lunatics
Scotland	1903	3.63	All in asylums, prisons, etc.
Ireland	1903	4.90	Does not include those in private houses
Canada	1901	2.38	All present during census year
France	1904	1.77	Inmates of institutions
Germany	1903	1.91	Inmates of all asylums
Norway	1902	0.80	" " "
Sweden	1903	0.97	2.35 by examination, 1.54 official insane notified
Denmark	1901	1.40	1.57 official
New York State	1903	3.39	All inmates of asylums at a fixed date
Massachusetts	1903	2.88	" " "
Michigan	1903	2.15	" " "
Wisconsin	1903	2.47	" " "
Minnesota	1903	2.13	" " "
Austria	1901	0.51	In asylums
Italy	1899	1.09	"

How inadequately expressed is the exact situation as judged by these figures may be seen in the fact that in those western states, Wisconsin

and Minnesota, where the foreign population in 1900 was 60 per cent., chiefly Teutonic and a young population, the asylum admissions are greater than Germany and three times as great as Norway and Sweden, while they are four times greater than in Austria and twice that of Italy.

It will be recalled that in the Canadian West the Teutonic immigrants admitted to asylums per 1,000 averaged, Germans, 0.34; Norway and Sweden and Denmark, 0.52; so that it is plain that the clearest distinction must be made in comparison between the official insane and the insane by census enumeration. Further it must not be forgotten that it is only the 15-24 year age-period, of all ages prior to 25 in which insane are found, so that an immigrant population with its relatively low child population will always show higher in the rate per 1,000 of population than it normally should.

How hospital and asylum accommodation is the chiefest factor in increasing the official asylum population is seen in different states. Thus the ratio of increase of insane in the asylums of New York was from 1880 to 1903, 62.5 per cent.; Wisconsin was from 1880 to 1903, 35.9 per cent.; Minnesota was from 1880 to 1903, 66.5 per cent. The latter, however, was relatively lower to start with in 1880, the rate being 1.46 as compared with 2.76 in 1903. The comparative study must, however, be much further refined if we wish accurate information. Thus the statistics of the Metropolitan asylums of London for 1907 are not instructive. Patients admitted were, 5,285 (or corrected for transfers, 3,554). This made an actual decrease of 43 over 1906. Of the attacks in 1907: 1,512 were first attacks of less than three months; 417 were more than three and less than 12 months; 651 were not first attacks of less than 12 months' duration; 46 were less than 12 months but not known of first attacks; 522 were more than 12 months' duration; 278 were unknown duration; 126 had congenital signs of insanity; six not insane. The percentage of first attacks to total admissions in 1907 was 55.3 per cent.

In pursuing my investigations into the asylums themselves in Canada I found that the transfers and repeated admissions of the same person, as seen in London, practically precluded the use of the year by year admissions as a basis of accurate comparisons.

But apart from this the problem, especially in the older provinces, was complicated by the fact that the place of birth if outside Canada caused the insane person to be registered as foreign-born, while he was often classed as an immigrant without the fact being mentioned that he was

admitted perhaps as a senile dement of 70 years and had been 50 years in the country.

Again in certain of the asylum districts, into which for departmental purposes Ontario is divided, the population is largely rural and have had between 1900 and 1908 few immigrants. In such it was found that the native-born Canadians in 1905-1908 gave a higher percentage of admissions than 1901-4—or about 90 per cent. in the latter, as compared with 77.7 per cent. in the former in the Brockville district. Superficial examination would lead us to the conclusion that the native-born Canadian was increasingly becoming insane; whereas the fact really was that year by year the old settlers foreign-born are dying off and the native-born is yearly increasing in the population. The same was shown in the French-Canadian population in the asylums of Quebec.

The fact is that a study of the insane in the foreign-born in America is only of any value where it is taken as we have done in Manitoba and studied it by age-periods. This was especially seen in Ontario, where there are eight asylum districts, and comparisons of admissions to each of these by ages was made. For instance, the Toronto district which probably receives 50 per cent. of the annual immigration to the province, as New York City does, was compared with the old Brockville district. The admissions per 1,000 were higher in the youngest population period in Toronto, and in the oldest in Brockville, than in any of the other districts. But while Toronto had nearly 50 per cent. more per 1,000 population for the age-period, 15-24, than Brockville, the latter had actually four times as many admissions per 1,000 for the period over 65 years.

What is further of great interest is that the Northwest Provinces, with a population increase in eight years of 150 per cent, mostly by immigration, as compared with that to Ontario of but 1-10 of the population, had but slightly more insane in the 15-44 age-period in the second group of years, this being that to which immigrants almost wholly belong.

As a matter of fact the total admissions in Ontario in 1907 over 1905 was but 47, and outside of Toronto there was in five asylums an actual decrease of 31 admissions. As a matter of fact there seemed but one province, that of British Columbia, where, during the four-year period of 1904-1908 the increase in admissions to the asylum of English-born immigrants seemed disproportionate to the total of immigrants who are known to have entered the province.

But the subject is one of extreme importance, and the existence and enforcement of immigration laws are alone likely to prevent the ingress of persons who are undesirable aliens.

SACRO-ILIAC STRAIN.

BY

J. APPLETON NUTTER, M.D.

Since the time of Hippocrates the condition of relaxation of the pelvic joints has been noted and discussed. The etiological factor has been childbirth, to which, it is true, the condition of pregnancy has sometimes been added. The subject of pelvic relaxation has received but scant courtesy at the hands of writers of systematic obstetrics. A search of medical literature reveals a few scattered allusions and occasional monographs by such eminent authorities as Winckel, Cazeaux, Trousseau, Smellie, Luschka, Cruveilhier, Velpeau and others.

To give a modern example, Whitridge Williams, in his Textbook of Obstetrics, speaks of spontaneous rupture of the pelvic articulations during labour, and states that pregnancy also may cause an increased mobility of these joints, due to the greater vascularity of the parts. This unusual mobility during pregnancy is taken advantage of by Dr. Walcher, who, in 1889, reported the increase in the anteroposterior diameter of the pelvis due to the nutation of the sacrum, when the so-called Walcher position was employed. This position, it will be remembered, was one of strong hyperextension of the thighs, the legs from the hips hanging free over the edge of a table, by means of which the iliac bones swung forward to the full extent of their motion on the sacrum, and so the pelvic inlet was enlarged. It must be noted that the condition of relaxation of the symphysis pubis was for long held to be of much greater importance than that of sacro-iliac disturbance. As a matter of fact, the reverse is the case. We may sum up briefly by stating that until the appearance of Drs. Goldthwait's and Osgood's paper in the *Boston Medical and Surgical Journal* for May, 1905, the condition of sacro-iliac and pubic relaxation was recognized, but only in its relation to parturition and pregnancy, and was treated by recumbency, bandages about the thighs, or in severe cases by appliances resembling heavy and close-fitting trunks.

This highly important study was entitled "A Consideration of the Pelvic Articulations from an Anatomical, Pathological and Clinical Standpoint," and was soon followed by papers at the hands of other surgeons, confirming and amplifying their conclusions. In June, 1907, Dr. Goldthwait read before the American Medical Association a second paper, entitled "The Pelvic Articulations, a Consideration of Their Anatomical, Physiologic, Obstetrical and General Surgical Importance."

Since the appearance of these papers the sacro-iliac joints have rapidly assumed the prominence to which they are entitled, and their importance from surgical and medical, as well as from obstetrical standpoints, has been recognized by the profession. Inasmuch as in Montreal nothing has yet been done to bring the subject before your notice, I have taken the liberty of putting together the salient features of sacro-iliac strain, which is much the commonest type of sacro-iliac disturbance of any kind. This is done in the certain expectation that many will find in this condition an explanation of obscure cases of leg and back pain, in many instances diagnosed sciatica, lumbago, etc. In fact, it is probably true that the majority of cases of sciatic pain have their origin in irritation at the sacro-iliac joint, an irritation which can in many cases be relieved.

It is, of course, recognized by all that any paper upon this subject must draw largely upon the studies mentioned above, and to these I refer any who wish a fuller exposition of the subject.

Anatomy.—The normal motion at the pubic articulation consists simply in a slight up-and-down play, and should be present in both sexes and at all ages. It will readily be seen that this motion depends entirely upon sacro-iliac movement, and can only be exaggerated if a corresponding exaggeration obtains at the sacro-iliac joints. We may, indeed, dismiss relaxation of the pubic symphysis as a cause of pelvic instability. The pubic bones have but little importance in this direction, and their principal function is to serve as a source of attachment for the abdominal muscles. The pelvic ring may, indeed, be lacking anteriorly, and no disability be present. This has been shown clinically in cases of exstrophy of the bladder associated with pubic deficiency, and other instances have been reported where the pubic bones have been found wanting, without symptoms. Full activity, even uncomplicated pregnancy and parturition, is possible in the absence of the pubic bones.

On the other hand, the joints (synchondroses) between the sacrum and the iliac bones are of decided importance, not only from their unprotected nature and consequently liability to trauma, but also as a result of their close proximity to the highly-sensitive nerve roots which form part of the lumbar and sacral plexuses. The opposed joint surfaces are broad and flat and covered with cartilage, the irregularities and depressions in each corresponding, so that the bones are indeed in contact but are not fused together. In some cases fine fibres unite portions of the auricular surfaces, in others pockets of synovial-like material are found.

The sinuous form of the opposed articular surfaces, together with the bulky posterior sacro-iliac ligament, constitutes the chief strength of

the joint. The sacro-iliac articulation is not immovable, as is sometimes stated. A small amount of motion is normally found here, the sacrum moving forward and backward around a transverse axis, passing through the middle of the bone at its second piece. If, as in the Walcher position, the sacrum moves backward above, the pelvic brim is enlarged. At the same time its lower extremity, with the coccyx, will move forward, diminishing the pelvic outlet. From a study of these joints it is evident that pelvic stability depends largely upon their integrity. They are protected by weak anterior and strong posterior sacro-iliac ligaments, and by numerous muscular attachments. Yet the joints are noteworthy in presenting no bony foundation in the shape of a socket, which might give them greater stability.

In the immediate neighborhood of the sacro-iliac joints are structures of the highest importance. The lower lumbar and upper sacral nerve roots, forming portions of the lumbar and sacral plexuses, are in close proximity. Those roots, which together make up the great sciatic nerve, unite directly over the lower part of the articulation. It is easily seen how undue mobility of the joint, or more so how a slight subluxation of the joint, may cause irritation of this great nerve and hence sciatic pain. But the great sciatic, though it seems to be the most susceptible, is not the only nerve that may be irritated. Close by are the obturator, with its area of cutaneous sensibility high up in the inner aspect of the thigh, the small sciatic supplying the back of the thigh, and giving branches to the perineum, the internal pudic to the genitalia, and others. Any one of these nerves, or all of them, are at the mercy of the sacro-iliac joint, and may be the source of referred pain from irritation where they cross the two bones. Although mechanical lesions alone are under consideration to-night, it may not be amiss to suggest that many intractable sciaticas are due to osteo-arthritic deposits at this joint. They would lie immediately beneath the nerve, and could easily be the cause of permanent irritation and pain.

Etiology.—In pregnancy, parturition, probably even at menstrual periods, owing to increased vascularity the ligaments relax and motion is increased at the sacro-iliac joints. As a result of parturition, the condition is more likely to have been caused by dystocia. To these may be probably added pathological conditions of the pelvic organs, such as uterine displacements, new growths, etc., which by causing pelvic engorgement soften the ligaments and allow more than normal motion. It must be noted that it is at times difficult if not impossible to state in a given case whether we are dealing with a simple physiological increase of motion, or with actual relaxation. However, it must be remembered that cases of this nature (i.e., those associated with pregnancy, etc.) are

rare when compared with those caused by mechanical strain of the joint. It has remained for Goldthwait and Osgood to point out that the sacro-iliac articulation may be, and frequently is, strained in men and in children. In fact, cases due to trauma far outnumber all other lesions of these joints.

The first and commonest type of sacro-iliac strain is that seen the result of a sudden effort, where a man, for example, is helping to lift some heavy object and suddenly has to bear the whole burden alone. This often produces the so-called "stitch" or "crick" in the back, with pain referred to the lower spine. The pain is indeed often referred quite definitely to the region of the posterior superior spine, which marks the sacro-iliac joint. The pain is due to rupture of some of the fibres of the ligaments, and if this be severe enough increased motion may be permitted, partial luxation possibly resulting. Please remember that there is nothing in the nature of the joint surfaces to strongly prevent luxation, nothing but the slight depressions and elevations which you all remember on the auricular surfaces of the ilium and sacrum. In ordinary cases the ligaments will simply be severely strained, and the sacrum will soon recover its normal seat. Whether increased mobility, luxation or merely strain result, the nerve roots in the vicinity, and especially those which actually cross the joint, will be irritated. It is to these that we owe the most intractable feature of sacro-iliac strain, for to the distribution of these nerves pain is referred. Among these nerves the great sciatic is the most readily irritated, and hence the frequency of sciatic pain as a symptom of this condition. Under such circumstances the futility of treatment applied to the back of the thigh is apparent.

A second type of sacro-iliac strain is that brought on gradually by anything causing disturbance of the normal relation of the spinal curves. Interference with the lumbar curve means generally interference with the sacrum in its relation to the ilia, and this may mean simple strain of the sacro-iliac ligaments or actual displacement of the sacrum. If the lumbar lordosis remains absent, with the patient erect, it generally means the latter.

Such a condition is frequently seen after prolonged recumbency, for example, after typhoid fever, or fractures, where as a result of general muscular and ligamentous relaxation the lumbar curve is lost and the spine is quite straight. The sacro-iliac ligaments have had to stretch considerably to permit this flattening, the elevations on the auricular surfaces are trying to accommodate themselves to strange depressions, for the sacrum has swung backward above as a result of over-straining its ligaments.

Post-operative backache will be more familiar to the surgeons. Lying on a soft mattress, the buttocks sink deeper than the rest of the trunk, giving support to the lumbar spine. On the rigid operating table, however, the lumbar curve is unsupported, and after prolonged anaesthesia it often has given way. Here, as above, the strain falls largely on the sacro-iliac ligaments, and the well-known backache results. It must not be assumed from the foregoing types that every case of sacro-iliac strain is associated with loss of the lumbar lordosis. Many cases will right themselves gradually, if aided by a pillow under the lower spine, and the lumbar curve will return. In some, however, the sacrum has become fixed in an abnormal relation to the iliac bones, and must be replaced if the pain is to be relieved. In other cases the strain is the result of heavy and prolonged work involving the use of the lower spine, without acute trauma. In these cases we may assume that constant and severe use of these joints has brought about a condition of undue mobility and hence strain. In another class we may put the cases due to long sitting in a lounging position, as witness the backache at the end of a long railway journey. Here the patient has been practically sitting on his lumbar spine and straining his sacro-iliac ligaments until they ache. In other instances long standing will bring on a strain of these joints.

Another class is composed of cases where the weight of the body is unevenly distributed between the two legs, as in hip disease, fracture of the neck of the femur, scoliosis and inequality in the length of the legs.

Lumbar (Pott's) disease, by interfering with the lumbar curve, may be a cause; in other cases obesity, pendulous abdomen and large abdominal tumours have caused strain of this joint.

Symptoms.—Pain is the principal symptom of sacro-iliac strain. This is as a rule both local in the neighborhood of the sacro-iliac joint, and referred down to the leg or foot by irritation of the lumbo-sacral nerve roots. The local pain is the more constant in its appearance, and is to be attributed to the strained ligaments and the efforts of the weakened muscles to overcome laxity here. It is usually associated with tenderness over the posterior superior spine, and may vary from a dull ache to excruciating torture. It is often almost constant, and is not as a rule benefited by recumbency, owing to the strain which this position throws upon the joint in question.

The referred pain shows a marked preference for the distribution of the great sciatic nerve, and almost every case of sacro-iliac strain has been at first diagnosed sciatica. The small sciatic, however, may show signs of irritation by pains down the back of the thigh, and symptoms referred to its upper and inner aspect show interference with the ob-

turator. All of these nerves are, as to their origin, close to the sacro-iliac joint, and capable of being irritated by undue mobility or sacral displacement.

Limitation of Motion.—By this is meant that those motions which throw a strain on the sacro-iliac joint are limited by pain. This is most characteristically seen when an attempt is made to flex the thigh of the affected side with the knee extended. The hamstrings, which have their origin upon the tuberosity of the ischium, are thereby stretched, and by pulling upon the ischium they tend to move the sacro-iliac joint. This causes pain, as a rule, and spasm of the hamstrings prevents further flexion. This movement of flexion is the only one at the hip principally concerned in the question of sacro-iliac disturbance. Ab- and adduction and extension are painful only when pushed to extremes. With regard to the spine, the patient characteristically stands with the body inclined away from the affected side, and lateral bending is limited. The erector spinæ can be seen and felt to be in spasm. Forward bending in the erect position is limited by spasm of the hamstrings, but with the patient sitting down with the knees flexed the hamstrings are relaxed, and motion is much more free. It is upon this sign that we depend in the differentiation of spinal disease from sacro-iliac disturbance. In both the spine is held stiffly, but a patient with spinal disease will maintain his stiffness of attitude whether sitting or standing, with his knees extended or flexed.

The patient is usually disabled and walks with a pronounced limp. He rises with the spine held rigidly, and gets about with extremely guarded motions. In fairly acute cases he is unable to take a long step forward on the affected side, as this, through the hamstrings, puts a strain on the joint. The leg soon shows disuse atrophy. There is usually no swelling at the joint, but in some cases crepitus can be made out here. This is best elicited by placing the thumbs upon the posterior superior spines, and having the patient raise his feet alternately, as though marking time.

With regard to the more remote consequences of sacro-iliac disturbance, it seems fair to assume that prolonged relaxation of the pelvic joints may bring on a corresponding weakness and relaxation of the muscles attached to the pelvic ring. The abdominal muscles, it will be remembered, play an important rôle in furnishing support to the abdominal viscera, and if weakened it is not difficult to understand how enteroptosis may result. The feeble back and belly muscles in turn add to the pelvic relaxation, and so a vicious circle is formed. It does not appear fanciful to suppose that in some cases of loose or misplaced viscera, accompanied, as is usually seen, by pendulous and relaxed ab-

dominal walls and an unstable pelvis, the condition may be more radically treated by attacking the loosened pelvic joints than by operations directed towards individual organs. It may be repeated in this connection that a pendulous and heavy abdomen is a well-recognized cause of sacro-iliac strain.

Diagnosis.—In general this does not present any unusual difficulty. The two most important signs are perhaps (1) pain and tenderness, usually without swelling, at the posterior superior spine, accompanied by (2) a leg pain often referred to the distribution of the great sciatic nerve, both of which are increased by flexing the thigh with the knee extended. The nerve itself is not tender, as would be the case in sciatic neuritis. With the patient lying supine, the knees kept extended, the leg on the affected side cannot be elevated to the normal extent, owing to hamstring spasm and pain. If the knee is flexed the leg can be elevated freely. Standing with the back bared, the body will usually be seen to be inclined away from the affected side, and in this side the lumbar muscles will be seen and felt to be in spasm. Forward bending of the back while in the erect position will soon be checked by painful spasm of the hamstrings. With the patient seated, this motion will be considerably more free, though still probably restricted. Side bending will be found limited, more so away from the affected side.

As to the demonstration of undue mobility at the sacro-iliac joint, it must not be thought that this is essential to a diagnosis. As a matter of fact it is more commonly found that there is restricted motion due to muscle spasm, and some cases show under certain tests restricted motion, under others motion to an abnormal extent. The test which has given the best results in my own experience consists in standing behind the patient, grasping the iliac crests, one in each hand, the thumbs covering the posterior superior spines, and having the patient raise the feet off the floor alternately. Undue mobility can be appreciated after some practice, and in two cases I have felt and heard crepitus under my thumb on the affected side. Another test of sacro-iliac mobility consists in placing one hand flat againt the sacrum and holding the pubic bones between the thumb and fore finger of the other hand, the patient raising the feet from the floor alternately. As before, one does not have to demonstrate undue mobility to establish a diagnosis of sacro-iliac strain.

A history of great strain while bending the back is, of course, suggestive, but a gradual onset, and the absence of acute trauma must by no means exclude the condition. In two of my cases there was a history only of heavy laborious work of a nature which would involve a strain of the sacro-iliac joints. In addition, loss of the lumbar lordosis is to be regarded as a probable sign of a sacrum that has swung back too far

at its upper end, and as a potential source of sacro-iliac strain. When accompanied by sciatic pain a flat back is extremely suggestive of sacral displacement.

Treatment.—Like all other joints, if the sacro-iliac articulation is strained it needs support, and if the bones are displaced they need reposition. In the great majority of cases there is no displacement, and support for the strained joint will quickly relieve the pain. This indication can be fulfilled in various ways. In acute recent cases strapping the pelvis will be found to give much relief. To do this we employ four or five two-and-a-half inch strips of adhesive plaster, going below one anterior superior spine to the other across the sacrum and buttocks. Pressing the iliac crests together tends to separate the joint surfaces, so care must be taken that the strips exert most of their force low down, at the level of the great trochanters. The strapping should be applied tightly, and needs renewal every three or four days. This method furnishes a therapeutic test of considerable value, and is a favorite procedure in outdoor treatment. It can quickly be applied in the office or clinic, and the relief usually at once felt, if it is applied properly, is an indication that the diagnosis is correct. Such patients are generally more comfortable at night if a small pillow is placed so as to support the lumbar spine.

In cases of long standing, where the treatment will probably extend over several months, a form of support which has been personally found useful is a wide non-elastic webbing binder, kept from wrinkling by the insertion of light steels, and lacing at the back. In males this generally requires perineal straps to keep it from working upward, in women it is attached to the corset. Another form of support which is well recommended consists in a pair of heavy woven elastic trunks, also lacing up the back. Both of these supports are made more efficacious by attaching a firm pad where it will press the upper end of the sacrum forward.

As has been said, at times the condition of the joint is one of subluxation. When this is present no support to the pelvic ring will give more than partial relief, for the sacrum needs to be replaced. A flat back, with obliteration of the lumbar curve, usually warns us of this subluxation, and to overcome it we endeavor to get the lumbar spine back into the hyperextension and to keep it there. At times the sacrum will slip into place by putting a firm pillow under the hollow of the back, at other times success is obtained by hanging the patient's body, face downward, unsupported, between two tables, thus getting forcible hyperextension. An anaesthetic with forcible manipulation is rarely necessary. When the hyperextension has been obtained, the bones are usually held in place by a low plaster-of-paris jacket, embracing

the pelvis, or better combined with a spica. After lying in this a few weeks, until the acute symptoms have disappeared, a light spinal brace is applied. This must maintain the lumbar curve, put firm pressure against the upper end of the sacrum, and at the same time give support to the pelvic ring. It will be worn for some time after all pain has left, and will be gradually discarded.

It is to be recognized that these conditions of sacro-iliac strain are accompanied by muscular relaxation, which is, of course, increased by the pelvic support. To overcome this weakness as soon as possible, exercises, massage and stimulating bathing are to be employed.

Following is a brief report of five cases from my own practice and the Montreal General Hospital during the past few months. It is to be noted that all are adult males.

Case 1. Male, 45 years old; laborer in sugar refinery. Complains of pain and tenderness at right sacro-iliac joint and through the right buttock. Onset without acute trauma a month previous. Crepitus and undue mobility felt at left posterior superior spine on raising leg from the floor. Body tilted to sound side. Limps badly. Pain markedly relieved by strapping. Fitted with canvas binder with perineal straps, which gave great relief.

Case 2. Male, 22 years old. Work involves much leaning forward and bending the back. No acute trauma. Sciatic pain had lasted nine months in spite of stretching the nerve, injecting sterile water, etc. Unable to work. Marked pain and tenderness at left posterior superior spine, and on raising leg crepitus and undue mobility of sacro-iliac joint are easily made out. A tight canvas binder gave immediate relief, but he finds that it chafes his thighs when working. An elastic support is being prepared for him.

Case 3. Male, 30 years old. On stooping to lift a heavy stone, aided by a companion, he was suddenly compelled to bear the whole weight alone. Felt something give in his back, and suffered excruciating agony for nearly a fortnight. Has recurrent attacks of sciatic pain, and still shows pain and tenderness over sacrum. When examined showed little but the local tenderness. No undue mobility made out. The nature of the onset and the location of the pain made the diagnosis of sacro-iliac strain very probable. Was not treated, as was leaving town.

Case 4. Male, 50 years old. Complains of severe pain referred to right sacro-iliac joint and down the right thigh to the knee. Brought on by heavy lifting, something giving way in his back. Shows typical restriction of motion at sacro-iliac joint due to spasm of hamstrings. Cannot raise the leg high in the air with knee extended, but with knee flexed it

can be raised much higher. Pain and tenderness subsided in a few weeks with pelvic support.

Case 5. Male, 30 years old. Aching pain with tenderness in sacro-iliac articulation, patient putting his finger on posterior superior spine when asked to show where pain was located. Associated with deformity of corresponding leg, ankylosed by old hip disease. No referred pains whatever. Immediate cause seemed to be undue amount of bending forward at an unsuitable desk. Pain was not helped by recumbency unless a pillow was put under lumbar curve. Subsided in a few days by avoiding prolonged desk work.

TWO CASES OF CHOLESTEATOMA OF THE MIDDLE EAR. RADICAL MASTOID OPERATION WITHOUT REMOVAL OF THE CHOLESTEATOMA MATRIX, (SIEBENMANN'S METHOD).

BY

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In presenting the following cases I wish to bring to your notice a method of dealing with cases of chronic suppurative otitis media, complicated with cholesteatoma, which has been advised by Siebenmann of Basel and practised in his clinic for many years with very satisfactory results.

Cholesteatoma is recognized as a most important and dangerous complication of middle ear suppuration, damaging the hearing and exposing the patient to grave danger of an intracranial complication. The predisposing causes of such a condition are severity of the original middle ear inflammation, leading to destruction of the normal lining, a more or less extensive destruction of the drum membrane, and chronicity of the discharge. To these must be only too often added neglect on the part of those in charge of the child, so that the ear is not encouraged to heal even to the extent of local cleanliness being secured.

Types of such severe inflammation are seen especially as complications of the infective fevers, such as scarlatina and measles. Virulence of infection is purely relative to the resistance of the individual so that delicate or strumous children are especially predisposed.

The pathology of the process consists of a destruction of the normal mucosal lining of the middle ear spaces and its replacement by an epidermal layer usually by direct growth inward from the skin lining the external auditory meatus. Such a process is a perfectly normal attempt

at repair, and, if the middle ear spaces are small and the destructive process limited, it forms an ideal healing. Where the destructive process has been extensive and continues after the epidermisation has entered the middle ear spaces the epidermal layer tends to desquamate and the exfoliated masses are added to the other products of inflammation. This gives to the discharge its characteristic offensive odour. Technically, there may be a difficulty in drawing a line between an ear healed by epidermisation and cholesteatoma, but in practical clinical work a little care in the examination overcomes the difficulty. The destructive character of cholesteatoma has been universally recognized, but authorities have not all been agreed as to the explanation of the process, or as to the best method of treatment. It has been commonly taught that where such a cholesteatomatous condition was met with during operations on the mastoid it should be thoroughly eradicated. Siebenmann, after extensive histological studies, concluded that the matrix of the cholesteatoma was not an invasive or pathological epithelial growth, but a natural attempt at repair, and that the destruction of bone about these cavities was due solely to increased pressure during periods of retention. Retention of discharges is very liable to occur in these cases by the blocking of the natural exits with masses of exfoliated epidermis.

Siebenmann's method of treatment consists in the free exposure of the middle ear spaces by the radical mastoid operation without disturbing the matrix, which, under these conditions, quickly assumes a healthy character not to be distinguished histologically from the lining of the cavity after the ordinary radical operation.

Advantages of the method are many: (1) The time of healing is greatly shortened, epidermisation being often complete in three or four weeks, whereas three or four months is a good average for the ordinary radical.

(2) There is a minimum interference with the bony walls of the cavity, so that there is less tendency to exuberant granulation and narrowing of the cavity.

(3) There is a minimum interference with the inner wall of the tympanum and so less danger of lessened hearing after operation.

It has been urged against the method that the tendency to exfoliation persists and that relapses are apt to occur. This has not been found true in Siebenmann's clinic, as I had an opportunity to observe in old cases returning for inspection after a period of absence varying from a few months to a year. In the present cases the result has been, I think, eminently satisfactory:—

Case 1. M. McD., aged fifteen years, referred to me on October 8th,

1908, by Dr. Peters for treatment of a suppurating ear. As in so many such cases, very little intelligent information could be obtained as to the onset or course. The statement was that the ear had been running for about a year; no date of onset could be fixed, as there had been no acute symptoms as far as she remembered. The patient had not noted any loss of hearing, pain in the ear or headache. Past history contained nothing of moment beyond an attack of measles at the age of five years, which was most probably the starting point of the otitis.

Examination showed a large polypus filling the left meatus almost completely, and around this escaped a very foul smelling purulent discharge. The right ear was normal.

Functional examination showed hearing normal on right, but reduced almost to complete deafness on left, conversational voice being heard only at a distance under one metre. The tuning fork reactions showed, Weber referred to left, Rinné positive on right, negative on left side. The nose and throat showed an atrophied adenoid, but nothing of moment.

On October 9th the polypus was removed under cocaine. The left drum membrane was found to have a large perforation involving the posterior upper segement, from which the purulent discharge poured freely, reappearing quickly after swabbing. The site of origin of the polypus was not visible, lying evidently within the attic or antrum. The lower margin of the perforation was adherent to the inner wall of the tympanum, and the epidermal layer was seen extending upward on the inner wall towards the auditus. The Eustachian tube was found patent, but not in free communication with the diseased region. Hearing was greatly improved by removal of the polyp, so that conversational speech could be heard up to three metres. The polypus was examined histologically, but showed only inflammatory tissue.

On October 12th, 1908, the attic was washed out, a large amount of pus and epidermal scales being removed. The diagnosis of cholesteatoma was made and radical operation advised but refused. Conservative treatment was continued, but with little effect, the discharge remained profuse and offensive. On one or two occasions cholesterin crystals were found in the washings from the attic.

On December 7th fresh granulations appeared in the perforation, and the hearing diminished to a distance of 1.5 metres, so that the radical operation was urged more strongly and accepted.

By the courtesy of Dr. Birkett, the patient was admitted to the Royal Victoria Hospital and a radical mastoid operation performed on December 14th, 1908. A large cholesteatoma cavity was exposed. The opera-

tion was the usual radical except that the matrix of the cholesteatoma was left undisturbed, being merely swabbed off and freed from polypoid granulations by picking the latter off with forceps. At the first dressing the discharge was rather profuse, but this quickly disappeared. The line of union behind the ear looked healthy at first dressing, but broke down and required a secondary suture on the seventh day.

On January 9th, 1909, the patient left the hospital with the retro-auricular wound healed, and on January 30th, six weeks after the operation, epidermisation was complete. Hearing on the left side was improved, so that whispered speech could be heard at 1 metre and conversational speech at a little over three metres. The ear was kept under observation until the 5th of July, 1909, and remained quiet and absolutely dry.

Seen again October 30th, 1909, after an interval of four months, there was slight accumulation of epidermis at the bottom of the cavity, but hardly more than one sees after the ordinary radical operation.

Hearing has remained the same as when last tested.

Case 2. I. C., aged seventeen years (Out-Door No. 8105, R.V.H.), came to the Outpatients' Department of Dr. Birkett's clinic on May 21st, 1909. The complaint for which she sought treatment was sore throat and stuffiness of the nose.

Examination revealed an adenoid of moderate size and a slight grade of chronic rhinitis. In the routine examination a much more important condition was found in the left ear, which showed chronic suppuration, with a very foul discharge. The right ear showed considerable destruction of the drum, but was healed and quiescent. On inquiry, the patient stated that she had had an attack of measles seven years before, with suppuration of both ears. The left ear had bothered her a great deal for several years after, discharging a great deal, and there had been recurring attacks of severe earache. During the past few years there had been no pain, so that the ear had not attracted much notice, although discharging.

The functional examination showed the hearing on the right, two metres whispered voice, and conversational speech over four metres. On the left, 1.5 metres whisper and conversation also over four metres. Weber test was referred to the right. Rinné's test was negative on both sides. The right drum membrane showed destruction of the posterior half with exposure of the inco-stapedial junction. The left drum membrane was swollen and no details could be made out. A perforation of the posterior upper segement gave free access to the region of the attic, from which came a moderate amount of thin pus and epidermal debris

with very foul odour. On washing out the attic, pus and epidermal scales were brought away but no cholesterin crystals were found.

On May 26th the adenoid was removed with nitrous oxide anaesthesia. Conservative treatment with attic irrigations lessened the discharge, but did not stop it. There was a slight amount of sinking of the inner end of the upper wall of the meatus, which did not decrease under treatment. After two months of conservative treatment a radical mastoid operation was advised and was performed on August 5th, 1909. A cholesteatoma cavity of moderate size was exposed. The details of the operation were the same as in the former case. The matrix did not show the same grade of inflammation at operation and the healing was very rapid. Primary union was obtained in the retroauricular wound, and there was practically no discharge from the wound after operation. Epidermisation was complete on August 25th, three weeks after the operation. Hearing was improved after the operation and has remained so up to the present. Whispered voice can be heard at three metres on the left and slightly over three metres on right.

I wish to express my thanks to Dr. Birkett for the opportunity of reporting these two cases from his department, and for the opportunity of operating on Case 1, and to Dr. Jamieson for the opportunity of operating on Case 2.

ACUTE ANTERIOR POLIOMYELITIS WITH AUTOPSY.

BY

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Acute Anterior Poliomyelitis, although a common enough disease, is in itself so seldom the cause of death that our knowledge of the pathological changes is still very limited. The following two cases, which occurred early in the epidemic lately affecting the northern central part of this continent, should be of interest.

Case 1.—Seen in consultation with Dr. Fraser Gurd. G. L., a well developed boy, aged 10 years, had been spending the summer with his parents among the Laurentian lakes, and, previous to the onset of the present illness, had enjoyed perfect health. Early on the morning of the 5th of August he complained of headache, and his mother noticed that his breathing was more rapid than usual. He had spent some time the previous day, which had been very hot, swimming, and then lying out on the roof of the cottage in the sun where there was a little breeze. Just about sunset he and some friends paddled some considerable distance down the lake, but on the way back after sunset, he did not paddle

but lay in the bottom of the boat; he was scantily clad in the light clothes he had worn during the heat of the day, and on being asked, said that his feet were cold. During the day of the 5th of August, the pain in the head and the back of the neck continued, his temperature was 100 F. and he would take no nourishment. The following day he had developed a flaccid paralysis of the lower extremities with loss of reflexes, the arms also were paralyzed, especially the left. Beyond the pain in the head and neck he did not suffer and his mind was clear, respirations still very rapid, but the temperature had fallen to normal and he took some light nourishment. The next day there appeared to be some improvement in the arms, but otherwise no change from this out, except that the respirations became more and more difficult. When he was seen for the first time by Dr. Fraser Gurd, on the 5th day of the disease, there was paralysis of the lower intercostals and the diaphragm; life seemed to be dependent on the extraordinary muscles of respiration solely, and as was to be expected the patient died that night of respiratory failure. The autopsy was performed by the writer and Dr. Gurd at the home of the parents, 10 hours after death. The brain and cord were removed, the other viscera could only be examined *in situ*, and showed no abnormality. Unfortunately we had not the facilities for bacteriological examination. There was nothing to be noted about the calvarium; the dura was of normal colour and glistening, there was no congestion of it either over the cord or brain. On removal the brain looked large for the size of the head; it weighed 1550 gm.

The superficial vessels are not particularly engorged, but the surface of the brain has a peculiar slightly bluish-grey colour, on section the edge everts showing the small capillaries of the cortex somewhat engorged in places.

Hardened in 5 per cent. formalin, on section nothing abnormal is to be noted beyond the slight general congestion of the vessels.

Cords.—The dura was covered posteriorly with a thick layer of fat; the dura itself looked healthy and glistening and was not engorged. On palpation through the dura, the cord felt extremely hard, especially over the lumbar and dorsal regions. On opening the dura, the vessels of the pia-arachnoid were slightly congested. The whole cord from the lower end of the cervical enlargement to sacral segments has the appearance of having been wound up carelessly but tightly with fine thread, showing everywhere little irregular ridges and bulges, evidently the swollen cord structure bulging through the meshes of the pial tissue. There was some slight cloudiness of the pia-arachnoid over the posterior surface. On section, the edges evert to a marked degree, and the

anterior horn region looks softened, swollen, and almost diffluent, that is in the lumbar, dorsal, and to less extent, the lower cervical region.

The microscopical appearances in the two cases are to all intents and purposes identical, and will be described later together.

Case 2.—The following is from Dr. McCrae's notes.

E., aged 24, single, engineer: admitted complaining of weakness, loss of appetite, pain in the right hip, and inability to use hands; seven days previously he had developed a sore throat, but worked till the second day before admission. On this day he went to bed. For these seven days, he complained of headache, at first frontal, then occipital, and finally the pain was in the neck. The day before admission he vomited thrice; was constipated; reported difficulty in thinking; on day of admission had dyspnoea when lying down.

His previous history is uneventful, save for a severe attack of neurasthenia at the age of 16 (several months' treatment).

On admission to the Royal Victoria Hospital at noon, his temperature was 99, his pulse 76. He could not hold a cup in his hand, his grip was weak. His breathing was jerky and abdominal; his pupils reacted to light and accommodation; there was no nystagmus; the fields of vision were normal; pharynx was sensitive; throat was clear; some pain was complained of in the neck on throwing the head forward. Dermatographia was marked; there was no tenderness of spine or hips; the abdominal reflexes were equal and active. Hands: grip was weak, semiflexed; the wrist and elbow reflexes were not obtained; knee jerks were lessened; Kernig was 135° on both sides; there was no Babinski; no Oppenheim; no Achilles obtained (tried when lying on his back); the sensations to rough tests were normal; all movements of the legs were normal except lifting, which was done weakly and with tremor. About 3 p.m., the temperature was 99, the pulse 76, the dyspnœa had increased; the accessory muscles of respiration were used; the jaw dropped at every inspiration.

At 7 p.m. when he was seen by the writer, in consultation, the condition was as described above. The respirations were about 65 and abdominal in type, the temperature was 99, the pulse 56. The patient did not present much cyanosis, and in spite of the extreme dyspnœa, the accessory muscles of respiration were not in action. At the same time it was interesting to note that the patient could use the sternomastoids voluntarily, to some extent at least, in turning the head on the pillow.

The left knee jerk was obtained but weakly. The muscles all contracted well to mechanical stimulation, for instance when struck with

a percussion hammer, and showed a condition of myœdema—that is, when they were struck or pinched, a slow localised contraction of the muscle occurred, giving rise to a small ridge, which disappeared again after twenty or thirty seconds. The muscles all reacted well to faradism.

At midnight the patient's temperature rose to 100 3/5 and the pulse 76. Cerebration was apparently quite clear. He died suddenly at 3 a.m. of respiratory failure.

At autopsy, which was performed 8 hours after death, the following conditions were noted:—The skull was of moderate thickness. The dura was firmly adherent to the vertex: sinuses free. The pia over the vertex was cloudy, with one small, quite thickened and white area on the left hemisphere about the middle, close to the longitudinal sinus, and in the immediate anterior extremity of the right frontal lobe was another, each measuring about 5mm. in diameter. The superficial vessels in the vertex were slightly congested. The pia over the base appeared normal but there was more marked congestion of the vessels over the brain stem. There was no thickening of the pia on the superior surface of the cerebellum. The brain weighed 1525 gms.

Cord:—The spinal dura appeared normal. On palpation, the cord at the lumbar enlargement was hard and felt like a lead pencil. In the dorsal region this was not noticeable, but in the upper part of the cervical region it could again be felt through the dura. On opening the dura there was no particular congestion of the anterior surface, but the posterior surface was congested, especially in the lumbar region and over the cervical enlargement. On the posterior surface there were numerous irregularly shaped hard pearly white plaques, almost cartilaginous in hardness. There was a slight tendency, especially in the lower dorsal and lumbar region, to a wrinkled appearance in a transverse direction, as if a fine thread had been wound irregularly but tightly about the cord. This is probably due to œdema of the cord. On section, in the lumbar region there was a moderate amount of eversion of the edges of the cord, and there was apparently a softening of the anterior horn on the left side. In the dorsal region this eversion of the edges, on section, was even more marked, and the grey matter was softened and indistinctly demarcated. There was congestion of the substance of the cord about the grey matter in this region.

The bacteriological examination, for which I am indebted to Drs. Klotz and Tytler, was as follows:

P.M. 94-09. Bact. Lab. No. 1867.

At autopsy cultures were made from (1) the heart's blood, (2) peri-

cardial fluid, (3) liver juice, (4) spleen juice and (5) cerebrospinal fluid.

At the same time smears were made from the various fluids collected and were examined in stained specimens. Organisms were found in the heart's blood, pericardial fluid and cerebrospinal fluid. The organisms from the different regions were alike morphologically, but were most abundant in the cerebrospinal fluid. These organisms appeared as cocci, occurring in pairs and occasionally in tetrads. A few were flattened but most of the organisms were spherical. The majority of the organisms were decolorized by Gram's method, but some resisted decolorization after the nuclei of the leucocytes were decolorized. The cerebrospinal fluid was distinctly cloudy and showed a large excess of leucocytes.

Cultural.—Organisms were found in the cultures taken from (1) the heart's blood, (2) pericardial fluid, (3) liver juice and (4) cerebrospinal fluid. No growth was obtained on any of the media on the first day. On the second day a growth appeared in plain serum water in all inoculations save those of the spleen juice.

Organisms could also be found on blood serum and blood agar media, although there was no macroscopic evidence of growth. Organisms were also found in the sediment of the dextrose broth tubes. Transfers made from the inoculated media to new tubes proved unsuccessful, save where serum water was used. In this latter medium three generations of the organism were obtained, but at the end of a week no further transfers grew on freshly inoculated media.

The organisms which were obtained in the cultures were morphologically similar to those noted in the direct smears. Most commonly the cocci were seen in pairs and not infrequently the individuals were much flattened towards each other. Here and there tetrads were noted. As a rule the organisms were larger than those seen in the direct smears.

The organisms stained well with the ordinary stains and with Gram's method were decolorized with some difficulty. It was found that after decolorizing five minutes some of the organisms still remained positive, while many had given up the stain..

Microscopically in both cases the picture was identical. There was active congestion of the spinal meninges and grey matter of the spinal cord, not only in that part but in the posterior horns as well. The blood vessels were distended, and some capillaries were ruptured with extravasation of the red cells. The perivascular spaces and the grey matter were filled with emigrating leucocytes. There was considerable

exudation of serum throughout the tissues. All varieties of degenerative change can be seen in the ganglion cells. Most cells have disappeared entirely, some are shrunken up, have lost their nuclei and stain deeply. Other cells appear like shadows of their former selves. Having lost their nuclei, they are in the process of being absorbed by leucocytes, which are clustered around them in great numbers. Others again appear swollen and pale, and the nucleus is dislocated to the side of the cell. In both cases the extent of the lesion is almost identical. In the medullary region there is active congestion of the meninges and the interstitial tissue, with the emigration of leucocytes, but the cells appear to be unaffected. In the upper cervical region, the congestion is more marked and the destruction of cells is practically complete, both in the anterior and in the posterior horns. The same may be said for the dorsal region, only at one level in both cases the cells in Clarke's column remain apparently unaffected.

In the lumbar region the same condition is present and it is only in the sacral region that one again finds cells retaining more or less their normal appearance, though here also many of them are in various stages of degeneration and demolition.

There would appear to be little doubt that we have in this disease a general infection affecting more particularly the spinal nervous system, the meninges, and not as is commonly stated the area of spinal grey matter supplied by the anterior spinal artery, but practically the whole of the grey matter and the white matter immediately surrounding it. The result is degeneration and atrophy of the ganglion cells and interstitial tissue. It immediately suggests that if the posterior horns are affected why do we not get sensory loss?

In my opinion it is a question whether we do not get sensory change. I have at present under observation a patient, aged 46, suffering from acute poliomyelitis, who, while otherwise perfectly typical, showed at first a slight impairment of sensibility to all forms.

The disease usually affects young children where testing sensibility, when only a relative impairment is expected, is utterly impossible.

Regarding the treatment, in the early stages, in fact immediately on the appearance of the paralysis, or indeed before this if such a development is suspected as likely to occur, as for instance during an epidemic, Urotropin seems to me to be indicated; we know that it is excreted into the cerebrospinal fluid and has there some antiseptic action; it should be useful then in the early stages. In the later stage, when the paralysis is established and is no longer progressive, i.e., during the first week or two after the onset, potassium iodide in small doses to aid in the

absorption of the œdema and exudation into the tissues of the spinal cord, should be of service.

Whether lumbar puncture is indicated or not I am not prepared to say. It does no harm if carried out aseptically, and if not too much fluid is withdrawn and if the fluid could be obtained very early in the disease, that is immediately on the onset of the paralysis, we might learn something as to the etiology of this disease.

THE

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CANADIAN MEDICAL ACT.

Let us hope that we are near the end of the controversy over Dominion registration and inter-provincial reciprocity in degrees.

In 1890 Dr. T. G. Roddick entered Parliament for the express purpose of promoting legislation to establish a Dominion board of registration, a council which would deal with all matters relating to the medical profession and make it possible for a graduate, after satisfying the council's demands, to practice anywhere in Canada. The bill was passed at the session of 1902, but among the conditions attached was one making it necessary for all the provinces to agree to the proposal. Four provinces then passed concurrent legislation to allow them to take advantage of the provisions of the act. A variety of circumstances prevented the same concurrence in the other provinces, and thus the measure has been rendered inoperative.

The present conditions are unsatisfactory. There are nine examining boards exercising jurisdiction in the different provinces, and the graduate must satisfy each of these as to his qualifications before he may practice in that particular province. Four western provinces, having tired of waiting for the act to be put in operation, were a short time ago about to establish a federation of their own, which would effectually divide the East from the West.

To avoid this calamity a conference was held in Montreal on November 16th, to consider a resolution passed at the annual meeting of the Canadian Medical Association in Winnipeg in August last, when

certain representatives of all the provinces of Canada were instructed to confer with Dr. Roddick in regard to the Act, in order to obtain any amendments necessary from the Federal House to make the Act acceptable to all the provinces.

The representative nature of the meeting may be judged by the names of those who were present, namely: Dr. T. G. Roddick, of Montreal, who presided; Drs. F. J. Tunstall, Vancouver; R. J. Blanchard, Winnipeg; W. Spankle, Wolf Island, Ont., representing the Ontario Medical Council; F. N. Starr, Toronto; R. W. Powell, Ottawa; Murray McLaren, St. John,; J. W. Daniel, M.P., St. John; John Stewart, Halifax; Geo. M. Campbell, T. L. Sinclair, Halifax; S. R. Jenkins, Charlottetown; E. P. Lachapelle, Montreal; H. S. Birkett, Montreal; L. P. Normand, Three Rivers, and A. C. Simard, Quebec, representing the Medical Council of the Province of Quebec.

The present proposal, we believe, is to seek authority from Parliament to make the Act applicable to such provinces as desire it, and allow those provinces which so desire, to remain under the present regulations. Thus the sacred principle of provincial rights will be maintained.

Under the British North America Act complete authority is reserved to the provinces to deal with all matters pertaining to education, professional and otherwise. They are free to deal in any manner they consider best, and if they choose to act jointly that also is within their rights. If any single province should see fit to act separately, no one questions its right to do so. It cannot, however, interfere with the liberty of action possessed by other provinces.

If Prince Edward Island, to take an example—though any other province would serve equally well for the purpose of illustration—were to decide that its interests would be best served by restricting the practice of medicine within its area to its own licencees, isolating the hinterland of the Canadian Federation, the remainder of Canada, so cut off from that privilege, could not very well object, but must bear the embargo as best it might. We do not imagine, however, that the practitioners of that province, important as it undoubtedly is, would go the length of forbidding Ontario and Quebec from making the arrangements separately or mutually which might appear best to them. In this there is a lesson for other provinces as well.

The truth is that we in the East are under a misapprehension about our own importance. We must find an outlet for our graduates in the West, where there is a large community which speaks our language. The West has room enough for its own and does not require access to our field.

DR. OSKAR KLOTZ' PROMOTION.

Dr. Oskar Klotz, assistant pathologist at the Royal Victoria Hospital and lecturer in pathology in the McGill Medical Faculty, will sever his connection with these institutions at the end of the year to accept the professorship of pathology in Pittsburg University.

Whilst we congratulate Dr. Klotz that his brilliant attainments have won a wider recognition, we regret that the profession in Montreal is to be deprived of his immediate services. Especially will he be missed by the Editorial Board of this Journal. He gave of his best promptly and cheerfully.

The college and hospital authorities here made efforts to retain the services of Dr. Klotz, but the importance of the new position was too strong an inducement. It carries with it the supervision of the pathological department of the eight hospitals connected with the University of Pittsburg.

Dr. Klotz is a graduate of Ottawa Collegiate Institute, and the medical school of Toronto University, and he spent some years in Europe, studying his special subject. He came to Montreal seven years ago and his original research work in the Royal Victoria and at McGill has gained for him a broad reputation.

Dr. Klotz is the youngest son of Dr. Otto Klotz, Dominion Astronomer at Ottawa, and has two brothers in the medical profession, Dr. Max Klotz, of Ottawa, and Dr. Julius Klotz, of Lanark.

INSANITY IN IMMIGRANTS.

The paper by Dr. P. H. Bryce, Chief Medical Officer, Department of the Interior, is a very important contribution to this subject, which has given from time to time occasion for discussion both in medical journals and in the daily press.

The studies on the subject which have appeared in medical journals have been prepared from the materials in the hands of the superintendents of asylums, but as indicated by the studies in Dr. Bryce's paper, it has been necessary, in order to deal fairly with this difficult problem, to collect with all the care possible, not only the total insane immigrants which have appeared officially in the several institutions of the different provinces, but also to study them both as regards the dates of their coming to Canada, their total number in relation to the total immigrant population and their relative proportion per 1,000, as compared with the insane in the Canadian population. The study has been especially extended to the population of the three Northwest

Provinces, Manitoba, Saskatchewan and Alberta, since, as is pointed out, not only have these been the recipients of the great part of the influx of immigrants during the past eight years, but also, owing to the relatively small numbers of previous population there, and the fact of two censuses, 1901 and 1906, having been taken during the period studied, (1900-1908) it has been possible to make the study a detailed one; the figures of the asylums, the Immigration Department and the Census Bureau supplying a range of information which is seldom attainable for such a study over so extended a period.

The population estimate has been made with unusual care, and Dr. Bryce seems to have endeavoured to eliminate every element likely to make for error in the population basis of calculation. Having provided for natural increases, the elimination, as far as possible, of native-born Canadians from old Canada, or as " returned " Canadians from the United States, it became a relatively easy matter to determine the rate per 1,000 of insane both in the total immigrants and in the immigrants by nationalities.

It is a matter for some surprise, when we remember that the total insane in Canada during the last census was 3.07 per 1,000, and those in asylums in Ontario, 2.5 per 1,000, that the total admissions of all persons to the Northwest asylums was so low a rate per 1,000, it being 0.339 for the census year 1901, and 0.335 for the census year 1906. But what is yet more remarkable is the fact that if the population estimated to the end of 1908 of 1,037,990 be taken and divided into the total admissions (1,982) during the nine preceding years, and assuming that all these are still alive and in the institutions instead of probably 40 per cent of them having recovered or died, the rate is even then only 1.9 per 1,000.

Dr. Bryce does not fail to point out the partial explanation in the relatively younger population amongst the newcomers. On the other hand this is balanced largely by the relatively smaller number of children in any given number of immigrants, the total actual coming to Canada being about 20 per cent. under 15 years, as compared with 35 per cent. in any normal population.

The study by nationalities is of interest, especially as illustrating the very high standard of health in the young Canadian and United States population, that for Canadians being only 0.19 admissions per 1,000 for a single year (the total admissions for nine years being reduced to an average), while that of immigrants from the United States was only 0.076. This latter is explained by the fact that in the census of 1906, all returned Canadians,, if going insane, would be classified as Cana-

dians because born in Canada, while they would be in the immigration returns classified as from the United States.

While it is notable that amongst the European peoples the British and German have a rate of 0.32 and 0.34 per 1,000 respectively, those from Scandinavian and the French speaking countries are distinctly higher, being 0.52 and 0.50 respectively. In part this is due to the fact that in smaller number the average of error is more liable to be greater, but there can be no doubt that, as compared with the peoples of Austro-Hungary and Russia, the latter are remarkably free from insanity, their rate per 1,000 of admissions being only 0.22 and 0.16.

An incidental fact, but still one of the most interesting brought out, is that in both 1901 and 1906 the male admissions to the Northwest asylums were distinctly greater in proportion to their numbers than were females, indicating, as Dr. Bryce states, that neither relatively nor comparatively is it true that the so-called lonely life of the prairie is seriously productive of insanity, as has been so popularly stated by those who least understand the purposes of the pioneer couples who go to the prairies. In fact, it is the history of the early pioneers of old Canada over again, and illustrates how the very demands for the output of physical energy have their resultant in a physical vigour beyond what is to be looked for in city life. Indeed, if we are to judge from statistics, there is developed, even in immigrants from the urban centres of Great Britain, a hope which is distinctly stimulating, and tends to build upward rather than towards enervation and mental unbalancing.

The remarkable differences between the total admissions in a single year to asylums as compared with the rate per 1,000 in England and New York, speaks volumes not only for the type of immigrant but also for the rural life which most in the new provinces live. The rate of annual asylum admissions is 0.5 per 1,000 in England and 0.80 in New York State, and only 0.27 per 1,000 in the Northwest Provinces. Brief but pointed references are made to the effect upon asylum admissions of the immigration in the older Eastern Provinces. The figures for Ontario asylums, it is pointed out, as published hitherto year by year, have not been of a character to make exact general comparisons of value owing to *repeat* cases and *transfers*. But the necessity for greater care in the comparative study of asylum admissions is seen, where, in 1908, the asylums of Ontario outside Toronto actually had fewer admissions than they had two years previously, while in Brockville, as representing the type of asylum for a rural district, the percentage admissions of Canadians increases year by year, the same as was found in the French asylums of Quebec.

Remembering that in the Northwest the population is now over 1,000,000 and increased in eight years 150 per cent, while old Canada has increased notably, especially in Quebec and Ontario, it is not possible, with so large an influx of people from many countries and many social stations, that the tragedies of life shall be wanting, or that with the stress of life in a new country and under novel conditions here and there mental break-downs will not occur; but we can congratulate Dr. Bryce upon presenting figures which we confess put a new face upon the whole problem; and should it appear, as indicated in his last report as Medical Officer of Immigration, that practically every insane immigrant arrived within two years has been deported, then Canada seems to be receiving much which goes to increase national development without paying any physical penalty therefor.

Reviews and Notices of Books.

SELECTED PAPERS ON HYSTERIA AND OTHER PSYCHONEUROSES. By PROF. SIGMUND FREUD, Vienna; authorized translation by A. A. BRILL, Ph.D., M.D., chief of Nervous Dispensary, Beth Israel Hospital; Clinical Assistant, Dept. of Psychiatry and Neurology, Columbia University; Assistant in Mental and Nervous diseases O. P. D., Bellevue Hospital; Assistant visiting physician, Hospital of Nervous Diseases, New York. Published by the Journal of Nervous and Mental Diseases Publishing Co., 64 West 56th St., New York.

This work is the fourth of the Nervous and Mental Disease Monograph Series and maintains in every way the high standard set by its predecessors. The papers of Prof. Freud have been well selected to give a clear, interesting and concise idea of his psychoanalytical and "cathartic" method of treating the various hysterias, phobias, and obsessions. They illustrate well also his views on the sexual origin of the acquired hysterias and of what he has termed the defense neuroses. The translation, in spite of Dr. Brill's modest remarks in the "foreword," is perfectly excellent. Anyone who has attempted to read Freud in the original, will appreciate this fully. While we realise that the details of Prof. Freud's technique might be modified to suit the personality of the physician, his method of analysing his cases and his views on the etiology of the conditions will be found to be extremely suggestive. They will give a much needed interest to the care of these usually troublesome patients. We can sincerely recommend the study of this small volume to all who are interested in the study of the functional nervous disorders.

C. K. R.

Outlines of Psychiatry. By William A. White, M.D., Superintendent Government Hospital for the Insane, Washington, D.C.; Professor of Nervous and Mental Diseases, Georgetown University, Washington, D.C.; Professor of Nervous and Mental Diseases, George Washington University, Washington, D.C., and Lecturer on Insanity, U. S. Army and U. S. Navy Medical Schools. Second edition, revised and enlarged. New York, The Journal of Nervous and Mental Disease Publishing Company, 1909. Price, $2.00.

In this the second edition of this work which appeared only a year ago, the article on Paranoia has been to some extent rewritten, and those milder forms referred to recently by Gierlich and Friedman given a place. In the article on General Paresis, the pathology and microscopical anatomy is taken up more fully and the recent diagnostic tests are mentioned.

Polyneuritic psychosis is discussed more fully and the forms of mental disturbances in Epilepsy, Cerebral Tumor, Lues, and Arteriosclerosis touched upon. These latter subjects are taken up much too briefly. It seems to us that where his space was so limited, the author would have been wiser to have omitted these altogether, as, in our opinion, they detract from the high standard set by the rest of the work. Apart from these subjects the work is excellent, giving one a clear, concise, and practical view of mental diseases. We can recommend it highly both to students and general practitioners.

C. K. R.

Immunity and Specific Therapy. By W. D'Este Emery, M.D., B.Sc. (London). H. K. Lewis, 136 Grover St., London, 1909. 12s. 6d.

This is clearly one of the best and most succinct outlines of the theory and practice of immunity in the English language. The author has given a clear exposition of the various phenomena of immunity. In a general introductory chapter the various terms and expressions used in serological studies are explained, so that the reader can follow the line of thought as it is carried out in the succeeding chapters. The author has given due credit to the various exponents of the theories of immunity and in the light of his own investigations has given them their proper weight. Not alone is the theoretical side of the subject discussed, but the practical method by which immunity is gained in the tissues is well demonstrated. The value of each type of immunity is discussed in connection with individual organisms.

The book in our opinion could be read with great pleasure by every

practicing physician. Moreover, the volume forms an excellent basis of study for the student. There is a valuable bibliography of the references consulted, appended to each chapter.

STUDIES IN TUBERCULOSIS. By HENRY CLARKE, M.A., M.D. (Cantab.), Liverpool. At the University Press. Archibald Constable & Co., Ltd., London, 1909. $1.25.

This study was prepared as a thesis for the degree of Doctor of Medicine, at the University of Cambridge. The author, a physician, pathologist and city councillor, has compiled some practical information regarding consumption. The subject matter has been arranged in three sections, the Diagnosis, the Prevention, and the Treatment of Tuberculosis.

In the forty-four pages of reading matter we find nothing original, but the author has, nevertheless, clearly arranged the salient points governing tuberculosis, and in a simple manner has directed the method in which a systematic attack must be made against the white plague by each municipality and the physician.

COMMON DISORDERS AND DISEASES OF CHILDHOOD. By GEORGE FREDERIC STILL, M.A., M.D., F.R.C.P., Professor of Children's Diseases, King's College, London. Oxford Medical Publications. Toronto: D. T. McAinsh & Co. Cloth, price, $4.50.

This book was reviewed in the October number of the JOURNAL. The name of the Canadian agent and the correct price are now supplied.

AN INVESTIGATION INTO THE MECHANISM OF THE PRODUCTION OF BLACKWATER. By J. O. WAKELIN BARRATT, M.D., D.Sc., and WARRINGTON YORKE, M.D. Annals of Tropical Medicine and Parasitology, Vol. III, No. I, 256 pages. 82 illustrations. University Press, Liverpool, 1909. Price, 10s. 6d.

This investigation reports the results of the work done in Nyassaland by an Expedition sent out by the Liverpool School of Tropical Medicine in 1907 to investigate Blackwater Fever. The authors approach the problem before them in a very thoughtful manner and the questions connected with their research have been studied in logical sequence. The report gives a most authoritative review of our present knowledge of the obscure disease called Blackwater Fever.

It has long been known that, in some cases, quinine may precipitate an attack of hæmoglobinuria. For this reason, the action of quinine and its salts upon the red blood cells was observed. It was found that while they were able to hæmolyse red cells *in vitro*, it would be impos-

sible for quinine to hæmolyse the red cells during life because it is impossible for the drug to ever become sufficiently concentrated in the blood to have this action. It was also determined that the red blood cells of blackwater fever patients are not more susceptible to hæmolysis by quinine bihydrochloride than are the red cells taken from a healthy individual.

These facts, added to clinical and other observations made by the authors, have convinced them that quinine should be given in blackwater fever if its administration be required by the presence of malarial parasites.

The appearance of hæmoglobin in the urine in paroxysmal hæmoglobinuria is determined by causes other than those which produce hæmoglobinuria in blackwater fever because the authors were successful in showing that no hæmolysin, nor absence of antilysin, occurred in blackwater fever; consequently, it is possible for them to assert that "the hæmoglobinuria of blackwater fever is not dependent upon hæmolysinæmia."

It was not certain whether free hæmoglobin occurred in the plasma of patients suffering from blackwater fever. The authors investigated a number of cases and they found that an increased amount of dissolved hæmoglobin occurred in the blood plasma of most, not all, cases of blackwater fever while hæmoglobin was present in the urine. This fact is particularly interesting because the authors produced experimental hæmoglobinæmia in rabbits and found that it was accompanied by a hæmoglobinuria intimately dependent upon it.

Suppression of urine is one of the most fatal and one of the most usual causes producing death in blackwater fever. It is shown that during blackwater fever large numbers of casts, many of them containing compact masses of coarse, black granules, are passed with the urine. By a series of splendid illustrations, it is demonstrated that the suppression of urine in blackwater fever is of mechanical origin and is produced by a blocking of the uriniferous tubes by plugs composed of "densely com-" pacted, dark, reddish granules, identical with those passed with the "casts during suppression." The presence of this granular material appears to be the sole pathological condition arising in the kidneys of patients dying from simple hæmoglobinuria.

The advisability of relieving suppression produced in this way by incision of the kidneys is discussed. While there is not much hope of saving the life of the patient in which the operation has become necessary, it is the opinion of the authors that incision is justifiable in from 24 to 48 hours after the onset of suppression of urine.

An attempt was made to determine the mechanism of the production of blackwater fever. So many factors entered into the consideration of the question that the authors were unable to reach a definite conclusion; as we have already indicated, the hæmoglobinuria is accompanied by, and is the result of, an accompanying hæmoglobinæmia.

J. L. T.

TREATMENT OF THE DISEASES OF CHILDREN. By CHARLES GILMORE KERLEY, M.D., Professor of Diseases of Children, New York Polyclinic Medical School and Hospital, etc. Second revised edition, octavo 629 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1909. Cloth, $5.00 net; Half Morocco, $6.50 net.

That the first edition of this book was so rapidly exhausted proves that it has supplied a real want. Most textbooks are too profuse for general use by the busy man, and he welcomes a manual which will give him the information he wants and the help he needs in a concise and simple fashion. That is just what Dr. Kerley's book does, and it is therefore more suitable for the general practitioner than for the student or the specialist. A very useful chapter is that on Gymnastic Therapeutics, and the illustrations give a good idea of the various measures recommended. Infant feeding is treated in a simple, common sense way and is a welcome relief from the elaborate articles which have been so fashionable of late years. It seems as if the pendulum were swinging at last towards simplicity, and that pseudo-science, for a time at least, had had its day. The directions given are clear and plain, the tone of the book dogmatic, and while we do not agree with the author in many things, we feel that he has the courage of his convictions and tells us just what he himself would do under certain given circumstances. There is too little of that strong personal element in many textbooks nowadays; too often they aim at being encyclopædic rather than practical guides to men who are in doubt or difficulty.

PRIMARY STUDIES FOR NURSES. A Textbook for First Year Pupil Nurses, by CHARLOTTE A. AIKENS, Detroit. Illustrated. Philadelphia and London: W. B. Saunders Company. Canadian agents, The F. J. Hartz Company, Ltd., Toronto.

This book contains sound instruction and good advice for women beginning their career as nurses. A nurse who is acquainted with all that this book contains would certainly be well instructed. In addition to matters of more purely medical interest there is an excellent section upon cookery. There is a large number of questions formally set forth

which should prove of great value to nurses who desire to test the extent of their knowledge. We venture to recommend this book as one which will prove entirely satisfactory.

A Practical Treatise on Diseases of the Skin. For the Use of Students and Practitioners. By J. Nevins Hyde, A.M., M.D., Professor of Dermatology and Venereal Diseases in the University of Chicago, Medical Department (Rush Medical College). New (8th) edition, thoroughly revised and much enlarged. In one very handsome octavo volume of about 1137 pages, with 223 engravings and 58 full-page plates, in colors and monochrome. Cloth, $5.00, net; leather, $6.00, net. Lea & Febiger, Philadelphia and New York, 1909.

This being the eighth edition of this treatise on diseases of the skin no words of praise are necessary to recommend it to the medical profession. The present edition bears only the name of Dr. Hyde on the frontispiece, but in the three preceding editions it was associated with the name of Dr. Frank H. Montgomery, whose untimely death last year was so much lamented by his dermatological brethren. Owing to the rapid growth of dermatological science it has been found necessary to add 250 pages to this volume, to include tropical skin diseases in a separate chapter, and to write new articles on such subjects as prurigo nodularis, the fourth disease, neuralgia paræsthetica, lichen spinulosus, Fordyce's disease, leukæmia and pseudo-leukæmia cutis, brown moth dermatitis, and many others. There have also been added 24 new plates and 120 new engravings. The book keeps up its character as a sound textbook and practical work of reference, and can be recommended as a most scientific treatise on dermatology. The illustrations are exceedingly good and most of the 58 plates are examples of what illustrations of skin disease should be. We heartily advise every one who wishes to have a modern scientific treatise on dermatology to possess himself of a copy of this work.

F. J. S.

Clinical Studies for Nurses. A Textbook for Second and Third Year Pupil Nurses, by Charlotte A. Aikens, Detroit. Illustrated. Philadelphia and London: W. B. Saunders Company. Canadian agents: The J. F. Hartz Co., Ltd., Toronto.

Miss Aikens will be remembered as the author of "Primary Studies for Nurses." The present volume is intended rather to serve as a handbook for the nurse who has already been trained and desires to prosecute her studies further. The book contains over 500 pages and shows

in its preparation a large experience and a wide range of reading on the part of the author. The arrangement of material is done with much skill and as a textbook is quite equal in authority to those which are provided for advance students of medicine.

THE MORPHIA HABIT AND ITS VOLUNTARY RENUNCIATION. By OSCAR JENNINGS, M.D. (Paris). London, Baillière Tindall and Cox; Paris, Brentano, 1909.

The preface to this book opens with a statement of "fact," that one medical man out of four is a drug habitué, usually a morphinist; that the proportion of medical addicts to the total of cases is in some statistics as high as 90 per cent., and that one-fifth of the mortality in the profession is said to be caused by morphinism. We take the liberty of contradicting the author. The volume is devoted in a large part to recording the experience of patients in their own words, who are striving to rid themselves of the habit. There is much interesting reading in the book; or rather, it might be interesting to those who are addicted to the practice of taking morphine.

THE PRACTICAL MEDICINE SERIES, Vol. IV., GYNÆCOLOGY. By EMILIUS C. DUDLEY, A.M., M.D. and C. VON BACHELLE, M.S., M.D. The Year Book Publishers, Chicago.

This volume opens with a discussion of the general principles of gynæcology of a practical nature, dealing with the problems the gynæcologist has to deal with every day. Diagnosis, technique and practical therapeutics, including local and lumbar anæsthesia; the technique and after-treatment of laparotomy; serotherapy and the opsonic index in gynæcology and passive hyperæmia and some of the latest methods of operating. The various infections of the female generative organs are dealth with, their differential diagnosis and treatment, with special reference to tuberculosis of the pelvic organs, and the various complications, particularly those of appendicitis, pyosalpinx and intrapelvic abscess. Malformations, tumours of the pelvic organs, their diagnosis and the technique and merits of the various operations for their eradication are discussed, hysterectomy and hysterotomy, together with displacements, disorders of menstruation and sterility.

Vol. V, OBSTETRICS, by JOSEPH B. DELEE, A.M., M.D., and HERBERT M. STOWE, M. D.

This little work contains, in reference form, the most recent advances made in the various problems presented to the busy practitioner. The physiology, pathology and diagnosis of pregnancy and abortion are first

taken up, followed by the latest experience in dealing with the various hæmorrhages and toxæmias of pregnancy. The work on eclampsia deserves special mention. Labour and the puerperium, operative obstetrics, and the treatment of puerperal sepsis complete this handy little volume.

Vol. VI, General Medicine, by Frank Binnings, M.S., M.D., and J. H. Salisbury, M.D.

This is a most useful volume and deals with the acute infections, typhoid, malaria, kala azar, cholera, Rocky Mountain spotted fever, Malta fever, glanders, dysentery and tuberculosis of the digestive tract. This is followed by a full review of the very latest methods of diagnosis and work on diseases of the stomach, intestines, liver, pancreas and peritoneum.

Vol. VII, Pediatrics, by Isaac A. Abt, M.D., and May Michael, M.D., and Orthopedic Surgery, by John Ridlon, A.M., M.D., and A. Steindler, M.D.

In the first part of the volume diseases of the new-born are taken up, the hygiene and dietetics of infancy, the various diseases of infancy and childhood, rickets, tuberculosis, syphilis, diphtheria, scarlet fever, whooping cough, measles, infection from vaccine, influenza, meningitis, typhoid, rheumatism and diseases of the gastro-intestinal tract. The serum treatment and lumbar puncture in epidemic cerebro-spinal meningitis are deserving of special mention.

In the second part orthopedics is taken up in a most thorough manner, including diseases of the spine and other joints and such conditions as Volkmann's ischemic paralysis, ischemic contracture, tuberculin in joint tuberculosis, the iodoform plug, osteitis deformans and myositis ossificans.

Physical Diagnosis, by Richard C. Cabot, Assistant Professor of Medicine in Harvard University. Fourth Edition, revised and enlarged. With five plates and two hundred and forty figures in the text. New York: William Wood and Company, 1909.

This work was written in 1905, and its rapid progress in editions shows that it has proved satisfactorily its claims. The changes in text and plates from the last edition are slight, and the work as a whole has been commended in these pages before. Its value in enhanced by the *personal* character of the book, in that the author will not write upon methods that are outside his experience. With a view to making a good book better we would mention that plate 200 is inadequate and that there is a badly-mixed paragraph on page 536.

DORLAND'S AMERICAN ILLUSTRATED MEDICAL DICTIONARY. By W. A. NEWMAN DORLAND, M.D. A new and complete dictionary of terms used in medicine, surgery, dentistry, pharmacy, chemistry, nursing and kindred branches; with new and elaborate tables and many handsome illustrations. Fifth revised edition. Large octavo of 876 pages, with 2000 new terms. W. B. Saunders Company: Philadelphia and London, 1909. Flexible leather, $4.50, net; indexed, $5.00 net.

This is the fifth occasion upon which we have had the pleasure of mentioning a new edition of this well-known dictionary. It contains new tables and many fresh illustrations and about 2,000 new terms. The book is compact, well printed and easily read. It has long ago passed out of the experimental stage and may now be regarded as a thoroughly reliable authority.

Retrospect of Current Literature.

MEDICINE.

UNDER THE CHARGE OF DRS. FINLEY, LAFLEUR, HAMILTON, AND HOWARD.

J. MAHLENBREY: (Erlangen Medical Clinic)"The presence of tryptic ferments in the Gastric Contents." (*Zentralblatt für die gesamte physiologie und pathologie der Stoffwechsels*). N. F. IV Jahrg.: 1909.

In view of the unreliability of the Cammidge's reaction as a test of the pancreatic function, this paper upon the Boldyreff test for trypsin seems worthy of consideration.

Historical.—Pawlow, in 1908, noted that when oil was introduced by a fistulous opening into a dog's stomach, one to two hours later one could withdraw an emulsified fluid containing bile and pancreatic juice.

Boas, in 1899, succeeded in obtaining by means of an ordinary stomach tube or special instrument in healthy persons, but more especially after obstinate vomiting, a mixture of bile, gastric and pancreatic juices, in which trypsin and steapsin were present.

Boldyreff, in 1907, studied the conditions under which a regurgitation of the intestinal juices occurred. He found that both fat and acids attracted the bile and pancreatic juice into the stomach. This author held that a combination of these substances, as a fatty acid in oil, would increase this reflux action, and proved his contention experimentally in animals. In the next place he applied this method with success to himself and another individual. He therefore considered that this method

could be made of diagnostic importance; further, that when a fat dietary was given, gastric digestion occurred chiefly through the pancreatic juice; thirdly, that the free acids and pepsin of the vomitus or gastric contents, especially after a test meal rich in fat, may be marked by the regurgitation of the alkaline pancreatic juice, which neutralizes the acid and so prevents peptic activity; finally he suggested the possibility of a tryptic digestion of the gastric mucosa as a cause of ulcus ventriculi.

Volhard, in 1907, reported that in 9 of 11 normal persons the oily gastric juice had a tryptic action. His pupil, Faubel, found a positive result in 22 of 37 cases examined. Volhard then studied three pathological cases (viz., carcinoma of the pancreas, acute enteritis and pancreatic diabetes) and found the tryptic ferment to be absent. In one case the autopsy revealed pancreatic atrophy.

Levinsky recommended the weakening of the gastric acidity by an alkali as a preliminary measure. He believed that the absence of the tryptic ferment signifies a pancreatic insufficiency, or a mechanical obstruction to the reflux of the pancreatic juice into the stomach (as in "hour-glass" stomach).

Ehrman and Lederer concluded from a large series of examinations that in achylia and anacidity the pancreatic function is not, as is usually considered, injured but possibly may be even more active than normal. If, however, hyperacidity be present the findings of tryptic ferments are negative (or very slightly positive in cases in which sodium carbonate has been previously given). Further, he believed that the mechanical influences of the passage of the tube, the gagging and the external pressure to the abdomen, are at least aids if not the cause of the reflux of the pancreatic juice, and not merely the fatty oil.

Koziczkowsky, in 1909, gave his support as to the value of the Boldyreff test for the pancreatic function, but recommended the use of 250 grains of cream instead of oil.

Method.—One gives to the fasting patient 100-200 c.c. of a 2 per cent. solution of oleic acid in olive oil, or even pure oil; this may be drunk or introduced by the tube. The gastric contents are removed in one-half to one hour, with the patient in the horizontal position. If nothing is obtained the tube is again introduced in one-half to one hour. The contents are allowed to stand and the pancreatic juice is pipetted off; 10 c.c. of fluid are sufficient for the necessary tests. Three parallel tests are made in an acid, alkali and neutral medium.

Volhard recommends the use of 200 c.c. of olive oil, which he removes in half an hour, when one can recover 50-100 c.c.; the oily fluid is removed from the watery juice by a separating funnel.

Levinsky suggests that half a teaspoonful of magnesia usta be given 20 minutes after the olive oil, to diminish the gastric acidity.

To demonstrate the tryptic ferments, Boldyreff uses Metts tubes (i.e., capillary tubes of coagulated egg albumen), and Volhard an alkaline casein solution of known strength. Upon the completion of the tryptic digestion Volhard adds a similar amount of HCl to all the test tubes, then precipitates the casein by means of sodium sulphate; the increase of acidity of the filtrate as a result of the tryptic action (due to liberation of the amino-acids and lower proteids) is titrated by means of sodium hydrate solution.

Fuld and Gross make use of a method, the principle of which is that casein, which is readily soluble in weakly alkaline solution, is reprecipitated by acidifying with one per cent. acetic acid. The casein solution contains 1.0 grain casein puriss. in one litre of one per cent. sodium carbonate solution, which is well shaken with chloroform to prevent bacterial fermentation. One uses 10 c.c. of this solution.

Abderhalden and Schittenhelm make use of polypeptides, especially glycyl-l-tyrosin, to demonstrate the presence of trypsin in the gastric contents; two grams of the former are added to 5 c.c. of the filtered juice when, if trypsin be present, the peptide is hydrolyzed into its components and the tyrosin is liberated as a crystalline percipitate. Later they recommended, for reasons of economy, the use of silk-peptone, which is a snow-white powder containing 45 per cent. of tyrosin.

Author's Researches.—He first tested the powers of resistance of pancreatin to the gastric acidity by giving a test breakfast—2.0 grams of pancreatin and 30.0 c.c. of a 0.1 per cent. soda solution. He found that in four cases the pancreatin had completely, and in two cases almost completely, disappeared. Hence he concluded that the gastric acidity must be neutralized before the administration of the olive oil.

Author's Method.—First a test breakfast was given to determine the total quantity, the physical characters, the total acidity and the percentage of free HCl. Next morning 150 c.c. of 2 per cent. oleic acid in olive oil were given by the stomach tube or swallowed by the patient. Prior to this a teaspoonful of magnesia usta (magnesia oxide) was given; 20 minutes later a second dose was given; three-quarters of an hour after the administration of the oil the gastric contents were removed; the amount varies from 50 to 70 c.c. and is of a greenish-yellow color. The gastric juice and oil are separated by means of a separating funnel: the juice which quickly falls to the bottom of the funnel is examined in the usual manner.

To determine the ferment content, 3 c.c. are placed in six test tubes:

to three to be tested for pepsin HCl is added (0.4 c.c. HCl for 1 c.c. of juice) and to the three to be tested for trypsin, sodium carbonate is added (0.3 c.c. n\n $NaHCO_3$ for 1 c.c. of gastric juice). To each series one adds (1) fibrin flakes, (2) Metts rods, (3) 5-10c.c. of casein solution. These six tubes are now placed in a thermostat for four hours.

In 41 examinations there were 38 positive findings. Of the three negative results two are explained by the non-administration of the alkali and the consequent destruction of the trypsin by the acid; in the third case there was a marked gastroptosis and hence a condition resembling an hour-glass stomach. In certain of the 38 positive cases there was an attendant hyperacidity, which was neutralized by the alkali, and hence the tryptic ferment was not destroyed. In other cases there was subacidity or even anacidity with well-marked tryptic digestion. The author strongly advises the use of several tests for trypsin, e.g., fibrin, Metts rods and casein, as every gastric juice will not act to all three in the same way. This difference in reaction depends, according to Bayliss and Starling, upon the presence of a special ferment, "erepsin," which acts only upon peptone, casein and fibrin, but not upon coagulated albumen. Sawitsch explains the difference rather by the difference of the concentration.

Finally, the author tested the Ewald-breakfast for the presence of trypsin, and found it negative in six cases; hence he believes that the oleic acid-olive oil is necessary for the regurgitation of the pancreatic juice.

He concludes that it is certain that in the Boldyreff method, if accurately used, we have a valuable diagnostic aid as to the proper function of the pancreas.

C. P. H.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The second regular meeting of the Society was held Friday evening, October 15, 1909, the President, Dr. W. Grant Stewart, in the Chair.

LIVING CASES: RESULT OF EXENTERATION OF THE ORBIT.

G. H. Mathewson, M.D., presented this case, showing the cosmetic result of this radical operation. The whole eyeball had been removed together with the outer two-thirds of the eyelids for rodent ulcer.

PATHOLOGICAL SPECIMENS: ACUTE ANTERIOR POLIOMYELITIS.

C. K. Russel, M.D., showed two specimens of the cord from patients dying of this condition, a report of which appears in this number of the Journal.

C. K. Russel, M.D. I have not yet seen Dr. Spiller's report of these cases. It is merely from the specimens of these two cases that I came to the conclusion that the disease was far more widespread than was ordinarily supposed. The destruction is greatest in the anterior horns certainly, but spreads to the posterior horn as well, and even the surrounding white matter shows congestion and infiltration. Undoubtedly the cerebrum can be affected and we know it often is; we have seen the pons, too, and the medulla. I have had cases of facial paralysis in infants. I know that Dr. Shirres had similar ones, which are undoubtedly, I think, anterior poliomyelitis. We have another case at the hospital where there was paralysis of the motor fifth on both sides, the seventh on the left and the 12th or hypoglossal, besides his left arm had been paralysed and some of the neck muscles. I was very much interested to hear of this dog and I think it is not at all unlikely that it is the same condition; I know that when I was at Queen Square Hospital we had two or three cases of infantile paralysis in patients who had come from South Africa, and they reported an epidemic there which attacked dogs and other animals as well as human beings. To give some idea of the extent of the epidemic I may say that at the Royal Victoria Hospital we have coming up for treatment at the clinics every week twenty cases, and on the last Monday we had four new ones; they had occurred during August. It seems to me that the epidemic is receding at the present time, as it usually does in other reported epidemics; the greater number of cases have fallen in July and August. Referring to the cartilaginous flakes in the cord in the second case, I have also seen a great many, especially at the National Hospital at Queen Square, where the brain and cord were taken out in practically every case. It struck me that we saw this condition present there much more frequently than at other general hospitals where I have been, and it seemed to me that it is more common among patients who are suffering from nervous diseases. This would perhaps account for Dr. Shirres seeing it so often, being interested, as he is, especially in nervous diseases.

SACRO-ILIAC STRAIN.

J. Appleton Nutter, M.D., read the paper of the evening, which appears on page 832 of this number of the Journal.

W. G. Turner, M.D It is with great interest that I have listened

to Dr. Nutter's paper this evening because it brings forward a question which has been very much talked of recently, especially in Boston. In the clinic at the Royal Victoria Hospital cases of the type described have presented themselves and we have been trying to classify the condition. Two main types are presented. In the first class there is stiffness of the back and a varying degree of tenderness over the sacro-iliac joints. In some cases, especially those which give a crepitus on examination, there is almost complete disability; in others a condition closely resembling a mild lumbago with or without pain down the sciatic or obturator nerve. In the second class of cases there has been found a tenderness over these same joints, but on examining the lumbar region there is tenderness along the exit of the nerve roots and an increase of the lumbar lordosis. We have found it necessary to vary our treatment accordingly. In the first type strapping, a pelvic support, or a corset fitted with the latter may be indicated; in the second type a fitted corset must be worn or even a plaster-of-paris jacket.

Certainly a certain number of lumbagos can be explained by the above condition, where the cause is found either in some condition in the sacro-iliac or in some strain in the lumbar vertebral column.

J. Appleton Nutter, M.D. I hope at some future date to present to the members of the Society some living cases which will demonstrate the mobility in these cases, which is perhaps not familiar to many.

IMPRESSIONS OF THE 16TH INTERNATIONAL MEDICAL CONGRESS AT BUDA PEST.

R. H. Craig, M.D.

This paper will appear in the January number of the Journal.

COCCYODYNIA.

A. Lapthorn Smith, M.D., read this case report, which appears on page 815 of this number of the Journal.

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